Powerful 80-Column Character Editor For The 128

Readers Speak Out On Software Piracy!

COMPUTE!'s GAZETTE

June 1988

$3.00
$4.25 Canada
02220

FOR COMMODORE PERSONAL COMPUTER USERS

WHICH IS RIGHT FOR YOU?

14 VERSATILE NEW COMMODORE-READY PRINTERS

Color, graphics, on-board fonts, NLQ, & more— for less!

64 ARCADE ACTION!

ARCADE VOLLEYBALL
Unique two-player version of America's favorite beach sport

JERICHO
How much cloth can a super moth eat? Plenty— if you can help it!

PLUS 8 MORE GREAT PROGRAMS!

06
0 71486 02220 6

FREE.

BUY 2, PICK 1 FREE!

We're sure that amongst all these choices, there's one that you'd like to pick – for free. So, go ahead – exercise your free choice by visiting your nearest retailer. Buy any two of these best-selling Electronic Arts products between April 1, 1988 and June 30, 1988 – and pick a third one for free!

To redeem your free software, simply fill out either your retailer's coupon or the coupon in this ad, and mail it with your proofs of purchase (see requirements on coupon) along with $3 for shipping and handling. If you can't find a participating retailer, order direct by calling 800-245-4525 (in CA, call 800-562-1112). Just tell us which products you want to buy, and what you want for free. Have your Visa/MC numbers ready.

HERE ARE YOUR CHOICES

- Amnesia
- Arcticfox
- The Bard's Tale
- The Bard's Tale II
- Chuck Yeager's AFT
- Deathlord
- Demon Stalkers
- Dragon's Lair
- Earl Weaver Baseball
- EOS: Earth Orbit Stations
- Get Organized
- GrandSlam Bridge
- Instant Music
- Instant Pages
- IntelliType
- Legacy of the Ancients
- Marble Madness
- Patton vs. Rommel
- PHM Pegasus
- Return to Atlantis
- Skate or Die
- Skyfox II
- Starflight
- Strike Fleet
- World Tour Golf
- B/Graph
- The Consultant
- DEGAS Elite
- DiskTools Plus
- Homepak
- IS Talk
- Outrageous Pages
- PaperClip Publisher
- PaperClip with Spellpak
- PaperClip III
- Thunder!
- Timelink

Product availability varies by computer format.
Ask your retailer or call (415) 572-2787 for details.

PICK ONE.

AND YOUR DELUXE CHOICES

Choose from our Deluxe Creativity Series for your purchase products. Or, redeem free Deluxe software when you buy any two of these Deluxe products:

- DeluxeMusic Construction Set
- DeluxePaint
- DeluxePaint II
- DeluxePhotoLab
- DeluxeProductions
- DeluxeVideo
- DeluxePrint II

ELECTRONIC ARTS®

All products are registered/trademarks of Electronic Arts.

PICK 1 FREE!

MAIL-IN COUPON

Please send my free software to the following address. I have enclosed the required proofs of purchase (specified below) and $3 (check or money order payable to Electronic Arts) for shipping and handling.

PLEASE PRINT.

Name _____

Address _____

City _____ State _____ Zip _____

My free software choice _____

The computer I own _____

PROOF OF PURCHASE REQUIREMENTS: Send the following original items: 1). the dated cash register tape(s) or sales receipt(s) showing the two products you purchased, and 2). find the Command Summary Card or the Manual (where no Command Summary Card exists) inside each package, cut off the part number on the back, lower portion of the Card or Manual.

MAIL TO: Electronic Arts, BUY 2, PICK 1 FREE, P.O. Box 7530, San Mateo, CA 94403. Only valid requests postmarked by July 15, 1988 will be honored. Allow 3-6 weeks for delivery.

STEALTH MISSION

Introducing a new generation of strategic gaming excellence from SubLOGIC! Stealth Mission redefines the state of the art in simulation sophistication and playability.

Easy flight and navigation controls, automatic landing and refueling systems, and a realtime pause feature allow you to exercise your strategic skills to the fullest. Quality programming eliminates annoying disk access.

Stealth Mission lets you fly three different jets; an F-19 Stealth fighter, the experimental forward-swept wing X-29, and a Navy F-14 Tomcat. Different flying techniques and weapons maximize the effectiveness of each aircraft. Even the Stealth fighter can be detected if you're not careful.

Select from eight different missions and ten skill levels. Choose the most effective ordnance to accomplish your mission goals. A targeting computer helps you detect, track, and lock onto enemy targets. Electronic Counter-Measures protect you from land, sea, and airborne enemy threats.

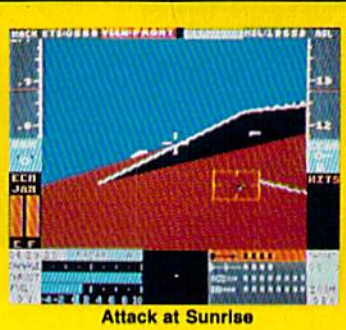
Improved 3D animation techniques provide dramatically faster frame rates for all cockpit views. Multiple external viewpoints are also available. And Stealth Mission includes complete VOR, ILS, ADF, and DME avionics for cross-country navigation.

Stealth Mission, the ultimate strategic simulation. From SubLOGIC.

See Your Dealer...
Stealth Mission is available on disk for the Commodore 64/128 computers for the suggested retail price of $49.95. For direct orders please include $2.00 for shipping (outside U.S. $6.25) and specify UPS or first class mail delivery. Visa, MasterCard, American Express, and Diners Club charges accepted.

© 1988 SubLOGIC Corporation
Commodore 64 and Commodore 128 are registered trademarks of Commodore Electronics, Ltd.

Great New Release! Scenery Disk # 11



Attack at Sunrise

Locked on Target-Missile's Eye View

Pop-Up Instrument Panel

subLOGIC
Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995
ORDER LINE: (800) 637-4983
(except in Illinois)

COMPUTE!'s GAZETTE contents

June 1988 Vol. 6, No. 6

features

Commodore-Ready Printers: The New Generation *Tom Netsel* ..... **12** *
A Buyer's Guide to Commodore-Ready Printers *Mickey McLean* ..... **18** *
A Guide to Commodore User Groups, Part 2 *Mickey McLean* ..... **63** *

reviews

Super Snapshot 3.0 and Slideshow Creator *Art Hunkins* **22** **64**
Kung-Fu Master *Robert Bixby* **26** **64**
Skyfox II: The Cygnus Conflict *Ervin Bobo* **27** **64**
Tetris *David and Robin Minnick* **27** **64**

games

Square Logix *Leonard Morris* **30** **128**
Arcade Volleyball *Rhett Anderson and David Hensley, Jr.* **32** **64**
Jericho *Robert Bixby* **66** **64**

programming

Ramdisk 64 *Bruce Thompson* **44** **64**
Big Screen Converter *Robert Bixby* **45** **64**
Pointer *Charles Prince* **52** **64**
Graphics Wedge *Phillip A. Gilley* **54** **64**
Excelfont 80: Super Character Editor for the 128 *Daihung Do* **56** **128**
Eight Thousand Dragons *Paul Carlson* **59** **64**
BASIC for Beginners: My Dear Aunt Sally *Larry Cotton* ..... **60** **128/64/+4/16**
Machine Language Programming: Where to Locate *Jim Butterfield* **62** **128/64**
3-D Bar Grapher for the 128 *Jon Atkinson* **67** **128**

departments

The Editor's Notes *Lance Elko* ..... **4** *
Letters to the Editor ..... **6** *
Gazette Feedback *Editors and Readers* ..... **8** *
D'Iversions: 8K Memory Is Enough! *Fred D'Ignazio* ..... **37** *
Horizons: Piracy—The Readers Speak Out *Todd Heimarck* ..... **38** *
Simple Answers to Common Questions *Tom R. Halfhill* ..... **40** *
The *GEOS* Column: *geoPaint* Super Chart *E. William Huffman* **41** **64**
Bug-Swatter: Modifications and Corrections ..... **42** *

program listings

How to Type In COMPUTE!'s Gazette Programs ..... **84** *
The Automatic Proofreader ..... **86** **128/64/+4/16**
MLX: Machine Language Entry Program for Commodore 64 and 128 ..... **88** **128/64**

Advertisers Index **100**

*=General, **64**=Commodore 64, **+4**=Plus/4, **16**=Commodore 16, **128**=Commodore 128

COMPUTE!'S GAZETTE (ISSN 0737-3716) is a COMPUTE! Publication, and is published monthly by ABC Consumer Magazines, Inc., 825 Seventh Ave., New York, NY 10019, a division of ABC Publishing, Inc., a Capital Cities/ABC Inc., company. © 1988 ABC Consumer Magazines, Inc. All rights reserved. Editorial offices are located at Suite 200, 324 West Wendover Ave., Greensboro, NC 27408. Domestic subscriptions: 12 issues, $24. POSTMASTER: Send address changes to COMPUTE!'s GAZETTE, P.O. Box 10957, Des Moines, IA 50340. Second class postage paid at New York, NY and additional mailing offices.

editor's notes

Everyone has to take science courses in high school. The big problem for me started with chemistry class. A barrage of elements, minerals, and chemicals, each with strange, cryptic abbreviations. Then came the bizarre chains that represent the various molecular structures: If we add H_2 here, will oxidation take place? If so, how is the carbon chain affected? Draw the new chain. You may recall the strange little diagrams that looked like many strings of pearls after several hours in a clothes dryer.

It was then that I began to suspect the Great Scheme. All of this information was too abstract, too far removed from the real world I thought I was beginning to understand through history, English, geography, even math. Well contrived, I thought, but not clever enough. People who had little or no talent for self-expression—writing, music, and art, for example—had long ago invented a secret society for the institution of bogus scientific systems and subsystems which has continued to expand and codify over the decades and centuries.

The culmination of my experience with that chemistry class was a drawing I made in answer to a final-exam question requiring one of those molecular chain contrivances. I drew a picture of bacon and eggs.

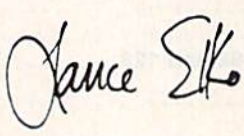
Freshman year, college. Required: Chemistry 101, with a two-hour lab every Friday. In the labs, I remember pouring combinations of oddly colored solutions together to make an even stranger-colored one with, maybe, some smoke rising. On paper, the string of pearls became even more convoluted. My Great Scheme suspicions were now zealous convictions.

While I held these beliefs closely over the years, I never shared them until many years later. My wife is very strong in the sciences and had taken a lot of chemistry and related courses in college. She was, by then, a clinical dietitian. One day after work, she was discussing how a certain hospital patient required this and that, but no potassium—and an IV solution because of electrolyte imbalance. I let loose. The restraining walls that had held my pet theory for so many years erupted. I accused her of propagating the confounding conspiracy, the Great Scheme. She laughed, hard. But I knew her to be an honest woman—and this added to my confusion.

In January 1983, intrigued by a new mass-market product—the personal computer—I splurged and purchased a Commodore 64 for $400. Computers fascinated me. After learning to program, I was hooked.

The following Thanksgiving, having been at COMPUTE! since the previous spring, I returned home with my wife for the holidays. Sitting around the table, some curious family members asked me questions about how these new computers worked. As the questions and answers became more complex, I heard myself explaining things about serial and parallel data transfer, raster interrupts, data storage, binary math, and electron guns used with RGB monitors. Electron guns? The great revelation. I had become a co-conspirator with my wife and old chemistry teachers. I was now part of the Great Scheme.

Welcome to the wonderful world of science.



Lance Elko
Senior Editor

COMPUTE!'s GAZETTE

FOR **COMMODORE** PERSONAL COMPUTER USERS

Editor	**Lance Elko**
Art Director	**Janice R. Fary**
Features Editor	**Keith Ferrell**
Technical Editor	**Patrick Parrish**
Assistant Editors	**Rhett Anderson** **Clifton Karnes**
Assistant Technical Editor	**Dale McBane**
Assistant Features Editor	**Tom Netsel**
Assistant Editor, Submissions & Disk Products	**David Hensley**
Editorial Assistant	**Mickey McLean**
Copy Editors	**Karen Siepak** **Lori Sonoski** **Tammie Taylor** **Karen Uhlendorf**
Programming Assistant	**Troy Tucker**
Contributing Editors	**Todd Heimarck** **Jim Butterfield** (Toronto, Canada) **Fred D'Ignazio** (E. Lansing, MI)

ART DEPARTMENT

Associate Art Director	**Lee Noel, Jr.**
Mechanical Artists	**Scotty Billings** **Robin Case** **Kim Potts**

PRODUCTION DEPARTMENT

Production Director	**Irma Swain**
Assistant Production Manager	**De Potter**
Typesetting	**Carole Dunton**
Advertising Production Assistant	**Anita Armfield**

COMPUTE! PUBLICATIONS

Group Vice President, Publisher/Editorial Director	**William Tynan**
Managing Editor	**Kathleen Martinek**
Senior Editor	**Lance Elko**
Editorial Operations Director	**Tony Roberts**
Editor, COMPUTE! Books	**Stephen Levy**
Executive Assistant	**Sybil Agee**
Senior Administrative Assistant	**Julia Fleming**
Administrative Assistant	**Iris Brooks**

ABC CONSUMER MAGAZINES

Senior Vice President	**Marc Reisch**
Senior Vice President, Advertising	**Richard J. Marino**
Vice President, Finance	**Richard Willis**
Vice President, Operations	**Lucian A. Parziale**
Vice President, Production	**Ilene Berson-Weiner**

CIRCULATION DEPARTMENT

Vice President	**Robert I. Gursha**
Subscription Staff	**Ora Blackman-DeBrown** **Mitch Frank** **Tom Slater** **James J. Smith**
Customer Service	**Kay Harris**
Single Copy Sales	**A. Heather Wood**

One of the ABC PUBLISHING Companies

President Robert G. Burton
1330 Avenue of the Americas
New York, NY 10019

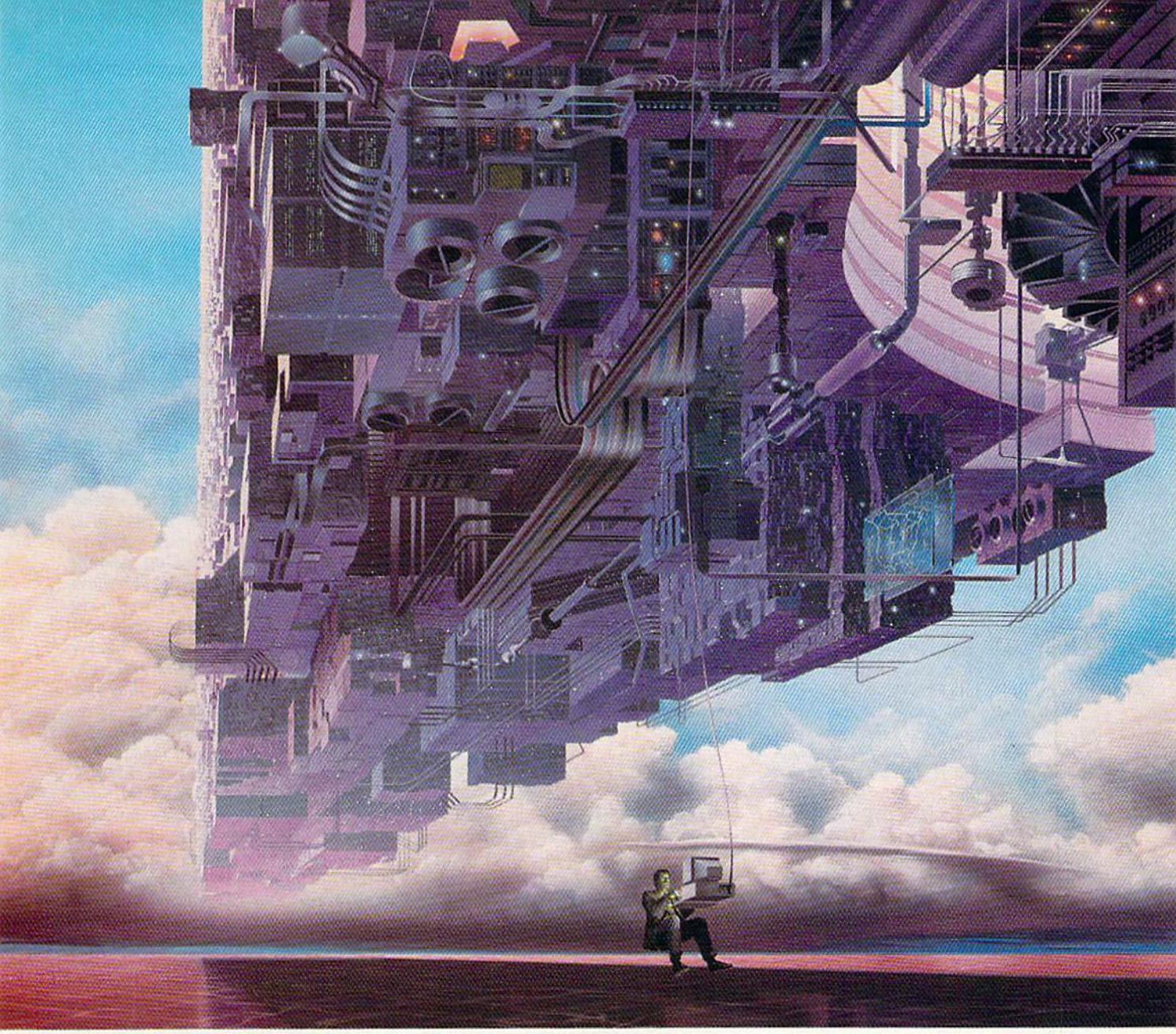
ADVERTISING OFFICES

New York: ABC Consumer Magazines, Inc., 825 Seventh Ave., New York, NY 10019. Tel. (212) 265-8360. Peter T. Johnsmeyer, Group Advertising Director; Bernard J. Theobald, Jr., Advertising Director
Greensboro: COMPUTE! Publications, Suite 200, 324 West Wendover Ave., Greensboro, NC 27408. Tel. (919) 275-9809. Kathleen Ingram
New England & Mid-Atlantic: Bernard J. Theobald, Jr., (212) 315-1665; Peter Hardy (617) 681-9000.
Midwest & Southwest: Jerry Thompson, Lucille Dennis (312) 726-6047 [Chicago]; (713) 731-2605 [Texas]; (303) 595-9299 [Colorado]; (415) 348-8222 [California].
West, Northwest, & British Columbia: Jerry Thompson, Lucille Dennis (415) 348-8222.
Southeast & International: Peter Hardy (617) 681-9000.

Address all advertising materials to: Anita Armfield, COMPUTE! Publications, Inc., 324 West Wendover Ave., Suite 200, Greensboro, NC 27408

Editorial inquiries should be addressed to The Editor, COMPUTE!'s GAZETTE, Suite 200, 324 West Wendover Ave., Greensboro, NC 27408

PRINTED IN THE U.S.A.



CONNECT YOUR COMPUTER TO A HIGHER INTELLIGENCE.

CompuServe's reference databases make you more productive, competitive, and better informed.

Remember the last time you tried to get your hands on hard-to-find facts? In a magazine article you read a year ago. In a news report you never saw. Or in a table of data you didn't know existed.

Imagine those facts just a few keystrokes away on your personal computer. Through CompuServe.

Your personal research center.

Save hours of research by going straight to the reference information you need in seconds.

Access thousands of sources of information in the areas of business, finance, medicine, education, demographics, science, law, news, popular entertainment, and sports.

What you know can help you.

Research an industry or company through articles, financial statements, and other sources. Analyze an investment. Assist in a job search. Follow market competition. Investigate a business opportunity.

Check characteristics such as age, income, and occupation in any U.S. community. For a geography report, a business plan, or a family move.

All you need to access CompuServe's unlimited world of information is a modem and just about any personal computer. Visit your computer dealer today. To order direct, or for more information, call or write:

CompuServe®

Information Services, P.O. Box 20212
5000 Arlington Centre Blvd., Columbus, OH 43220
800-848-8199
In Ohio and Canada, call 614 457-0802
An H&R Block Company

letters to the editor

Plain Vanilla Reviews

Let's discuss your software reviews. They are much too vanilla. What is sorely needed is a rating system that will rate software in several categories, including a warning if the product's copy-protection scheme will rattle the disk drive head.

Robert Nellist
Brockport, NY

We've heard this complaint off and on over the past five years, and we addressed it way back in the July 1984 issue. We haven't stated our position on software reviews in recent years, so since it remains the same, here's how we addressed it four years ago in the July 1984 "Editor's Notes."

"A number of readers have asked why we don't 'grade' our reviews or 'degrade' some products. Essentially, any product we review is, in our opinion, of merit. We feel that it's only worth your time and space in GAZETTE *to review products that are well designed. The market is flooded with products, and we'd rather tell you about the good ones.*

"While the grading of products may be helpful to some readers, it is often unfair to the product. If you've ever read reviews of records you really like, only to see a thumbs down or a poor grade, you probably wondered if the critic heard the same thing you did. The goal of quantifying a product with a letter or number grade is to be objective, yet it's often subjective and arbitrary. If we took a poll of our staff, we'd have a number of different answers."

To augment this position, it remains true that our staff and outside reviewers have varying opinions on software products. If there's a general consensus among our staff that a product is not good, we'll pass on it (regardless of who published it). Whether a good product should get a B *or an* A− *is eternally debatable.*

Our reviewers are sensitive to products that are abusive to the disk drive. And many have made notes to that effect in a number of reviews in the past year.

WordStar for CP/M

I've just read the excellent article in the March 1988 issue entitled, "Super CP/M Software for the 128, Part 1: Writer's Toolbox," by Clifton Karnes. I have always wanted to purchase *WordStar*, but I didn't think I could afford its hefty price tag. Your article got me to thinking. If I could purchase *WordStar* 2.26 from PDSC at $39.95, I could then upgrade to *WordStar* 4.0 for $89.

Then I saw an article in *FOGHORN* that said *WordStar* 4.0 was now available to *all registered CP/M users for $89.* I couldn't believe that this word processor was available to 128 users for less than $100. I thought your readers might like to know about the new version of *WordStar* and its new low price.

John L. Gordon
Chadds Ford, PA

When MicroPro first released the CP/M version of WordStar *4.0, it was available only as an upgrade for owners of previous versions. As you stated in your letter, it's now available to any CP/M user at a bargain-basement price of $89. You can order* WordStar *4.0 from MicroPro at (800) 227-5609, extension 761.*

SpeedScript Copyright

What is the present copyright status of *SpeedScript*? A couple of our user group members say they have seen a notice releasing the program to public domain.

James C. Ladd
San Antonio, TX

We have not released SpeedScript *to the public domain, nor do we have plans to do so. While we own the copyright to* SpeedScript, *we do grant permission for user groups (or any individuals or organizations) to provide disk copies of* SpeedScript—*or any of our programs—to individuals who own a copy of the issue in which the corresponding article was printed. Version 2.0 of* SpeedScript *is in the January 1984* GAZETTE; *version 3.0 is in the March 1985* COMPUTE!; *and version 3.2 is in the May 1987* GAZETTE. *Each of these issues contains full documentation.*

Copying *GAZETTE* Disks

I would like to know how to copy my *COMPUTE!'s Gazette* disks. Are they write-protected? If so, why?

Peter J. Cotton
Waukesha, WI

The GAZETTE Disk *is write-protected as a result of a damaging incident several years ago. A program on a 1985 disk, which was not write-protected, included a feature which reformatted the current disk in the drive. A number of subscribers loaded the disk menu, then pressed a key to load the program, which itself contained a menu. After pressing a number corresponding to the menu selection which reformatted the disk, they lost everything. We had a large number of returns—and a lot of phone calls. We decided at that time to write-protect the disk as a safeguard for both ourselves and subscribers. In retrospect, we're glad we did. Since that incident, we've published dozens of programs that are designed to write to disk. When those programs are published on disk, we include a message screen to remind the user that disk is write-protected.*

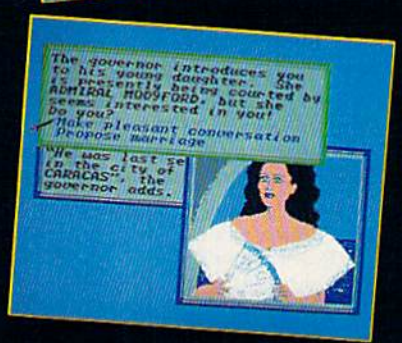
While the disk is write-protected, *it is not* copy-protected. *Any* GAZETTE *program can be saved from memory directly to a blank, formatted disk. Over the years, we've published a number of copy programs that can help with this. The most recent is "Disk Rapid Transit" (December 1987) which is easily the fastest copier program we've published. In general, copy programs are available—with varying quality—in the public domain and in user group libraries.*

DARE TO BE DIFFERENT

Hot New Simulations From The Computer Craftsmen At MicroProse

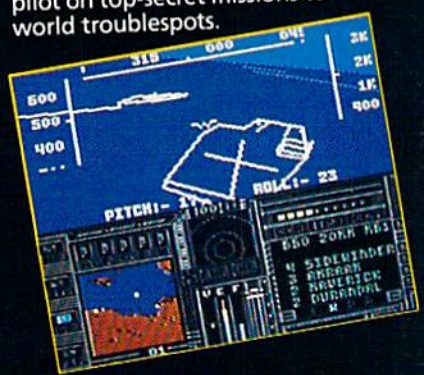
High Seas Adventure

Relive the swashbuckling era of the buccaneer as a 17th century privateer captain in **PIRATES!** It's a unique gaming blend of simulation, adventure and role-playing. You'll swordfight with other ship captains, storm the fortress of a wealthy town, explore the Caribbean, and search for lost treasure. The goal: amass a fortune, gain a reputation, and retire to a life of luxury. From award-winning game designer Sid Meier, of **F-15 STRIKE EAGLE** and **SILENT SERVICE** fame.


The governor introduces you to his young daughter. She is presently being courted by ADMIRAL MOODFORD, but she seems interested in you! Do you?
Make pleasant conversation
Propose marriage
"He was last se in the city of CARACAS", the governor adds.

Top Secret Air Strike

Invisibility is your greatest weapon in **PROJECT: STEALTH FIGHTER,** a simulation of the Air Force's unacknowledged super-tech jet fighter of tomorrow. You're the pilot on top-secret missions to world troublespots.



Daring Solo Missions

Become one of America's most elite soldiers in **AIRBORNE RANGER.** Cunning and fast reflexes are needed to succeed on 12 solo missions deep behind enemy lines.

Available at a Valued Microprose Retailer (VMR) near you. Call for locations. If not found locally, call for MC/VISA orders.

PIRATES! now for Commodore 64/128, Apple II, IBM-PC/XT/AT/PS2/Tandy and compatibles. Suggested retail $39.95.
PROJECT: STEALTH FIGHTER (Suggested retail $39.95) and **AIRBORNE RANGER** (Suggested retail $34.95) for Commodore 64/128. Coming soon for IBM-PC/Tandy compatibles.

MICRO PROSE™
SIMULATION • SOFTWARE

180 Lakefront Drive • Hunt Valley, MD 21030 • (301) 771-1151

Do you have a question or a problem? Have you discovered something that could help other Commodore users? We want to hear from you. Write to Gazette Feedback, COMPUTE!'s Gazette, P.O. Box 5406, Greensboro, NC 27403. We regret that, due to the volume of mail received, we cannot respond individually to programming questions.

Stop Scrolling

I adapted the algorithm for scrambling the random numbers 1–1000 in the March 1988 "Gazette Feedback" column to pick random numbers in the range 1–48 for the New York state lotto.

One minor problem presents itself. The column of numbers scrolls out of sight before the program reaches the 48th number. Could you print an addition to this program that would print the numbers in four or more columns across the screen?

Robert G. Farricy
Syracuse, NY

A variety of solutions present themselves. If you're using a 128, you can press the NO SCROLL key to freeze the screen. Press it again to unfreeze it. On the Plus/4 and 16, use CTRL-S to freeze and CTRL-Q to unfreeze.

On the 64, you can build your own print-freezing routine. If you want to check for a keypress between lines 60 and 70, add these lines:

```
65 GET A$: IF A$="" THEN 70
66 GET A$: IF A$<>"" THEN 66
```

In line 65, the program checks for a keypress. If the user didn't press a key, the program jumps forward to line 70. At line 66, it waits for another keypress and doesn't break out of the loop until the user hits a key. Note that both lines use two double quotation marks with nothing between them. This is a null string, *a string that contains no characters.*

A quicker way to freeze the screen is to press the RUN/STOP key. When you want the program to continue, type CONT.

If you'd prefer to see all 48 numbers on the screen at the same time, you can print them in columns. Just add a comma after the variable name in the PRINT statement. Substitute **PRINT X(I),** *(with a comma) for* **PRINT I,X(I)** *and you'll see 12 lines of four columns.*

Doctor, Doctor

I have recently purchased a 1581 disk drive. I can't get my directory organizers and disk cataloger programs to work with it. I guess this is because there are twice as many tracks, which makes programs for the 1541 incompatible with the 1581. Can you help?

Seth Meashey
Woodbridge, VA

A disk operating system (DOS) stores information in two sections: the directory and the rest of the disk. DOS designers can make disk access slightly faster if the directory is located on the middle track. A 1541 disk puts the directory on track 18 because there are a total of 35 tracks. When a program is found in the directory, the drive's read/write head will move a maximum of 17 tracks to track 1 or track 35.

A 1581 disk has 80 tracks, and the directory is located on track 40 (the middle of the disk). If you happen to have a disk doctor or directory organizer program for the 1541, it probably expects to find the directory on track 18. The programmer assumed the directory would always live on track 18.

Two suggestions come to mind: Either modify the program to look for the directory on 40 instead of 18, or write to the company that released the original program and ask them if they are working on a new version for the 1581 drive.

The Best Language?

I was wondering which language the creators of commercial games use—machine language or BASIC or some other language I don't know about? I was also wondering if a person like me could learn how to create games like the ones on the market today.

Craig Cassata
Orland Park, IL

Although some smaller software companies sell programs written in BASIC, most commercial software for the 64 and 128 is written in machine language (ML) because it doesn't use up much memory and it's very fast. On computers such as the IBM PC or Amiga, C language is popular because it's almost as fast as ML and it's fairly portable, meaning that you can write a program for the PC and then "port" it over to the Amiga or another computer. Pascal, Modula-2, Forth, and various other languages are also used for commercial development.

Some software companies assign an entire program to one programmer, but, on complicated projects, the work is sometimes split up between people who specialize in sprites, sound, and other aspects of a project. Some companies use expensive—and very fast—minicomputers to develop Commodore software (imagine a $20,000 computer running an emulator that makes it act like a $200 Commodore 64). Infocom has its own language for writing adventure games, the Zork Interactive Language (ZIL). After creating a game and the generic packaging and documentation, they can quickly compile it into several dozen versions for different computers. The resulting program is machine language, but it wasn't written directly in ML.

Some companies write all of their programs in-house, but others hire freelance programmers. Still others will evaluate software and buy it if they like what they see. If you're interested in freelance programming, write to various software companies and ask for their Author's Guidelines. Another avenue is writing for GAZETTE. *Many of our programs are written by readers like yourself.*

Vexed by Hex

My printer has many capabilities that I have been unable to use, as I am unable to give the proper commands with the information I have available. The user's manual gives commands such as this:

CHR$(&HE) Set enlarged characters
CHR$(&H4E) Select pica characters
CHR$(&H51) Select condensed characters

Is there any cross-referencing information available for translating these codes to the 64?

Paul Offutt
Louisville, KY

Some computers, but not the 64, use the &H prefix to mark hexadecimal (base 16) numbers. You'll have to translate the hex values into decimal. Just remember that the hex numerals A–F correspond to the decimal values 10–15 and that the second number from the right is the sixteens' place (not the tens' place).

*The three CHR$ codes you listed translate into CHR$(14), CHR$(4*16+14), and CHR$(5*16+1)—or 14, 78, and 81.*

Prepare for the ultimate fantasy when the first official Advanced Dungeons & Dragons®

Game Product comes alive on your computer!

POOL OF RADIANCE
Commodore 64/128.
IBM PC/Compatibles.
Conversions are in the works for Apple and other personal computers.

SSI proudly presents *POOL OF RADIANCE*, the culmination of its collaboration with TSR to bring the legendary ADVANCED DUNGEONS & DRAGONS® fantasy role-playing system to your home computer.

POOL OF RADIANCE is set in the huge, complex world of the Forgotten Realms, a world brought to life by the combined talents and skills of top designers and programmers from both companies. Its game system adheres faithfully to AD&D® standards. Its state-of-the-art graphics push the very limits of the computer's capabilities. The only way to believe it is to experience it for yourself — wherever game software is sold.

Look for the entire line of AD&D computer products coming soon from SSI.

Roll up your characters and see their portraits and characteristics. (C-64/128 screen display.)

Every single monster type is individually drawn by superb computer graphics. (IBM PC screen display.)

STRATEGIC SIMULATIONS, INC.
1046 N. Rengstorff Avenue
Mountain View, CA 94043
(415) 964-1353

ADVANCED DUNGEONS & DRAGONS and AD&D are registered trademarks owned by TSR, Inc.

STRATEGIC SIMULATIONS, INC.

©1988 TSR, Inc. ©1988 Strategic Simulations, Inc.
All rights reserved.

CHR$(78) and CHR$(81) are the ASCII values of the letters n *and* q. *If you send these characters to the printer, it will just print an* n *or a* q. *It's likely that you'll need to send an Escape code, a CHR$(27), first. Try this: OPEN 4,4,7: PRINT#4, CHR$(27);"N": CLOSE 4. If your interface automatically translates from Commodore ASCII to true ASCII, you may need to experiment with using uppercase or lowercase for the letters like* n *and* q.

Commas Instead of Periods

I have a question concerning the keypad and the 128. When inputting a program with numerous DATA statements, I have found it easier to use the numeric keypad. Is there some way to redefine the decimal point to a comma? If so, I wouldn't have to reach across to hit the comma key.

Donald Hebert
APO, NY

The 128 uses five lookup tables to translate keyscan codes to ASCII values (for more information, see the entry at location 830 in Mapping the 128 *from COMPUTE! Books). The five tables correspond to the five keyboard maps: plain (unshifted), SHIFT, Commodore, CONTROL, and ALT. The default location for normal, unshifted keys is 64128. The first thing to do is copy the table from ROM down to RAM. Line 20 does this in the program below. The period (decimal point) on the numeric keypad has a keyscan code of 82. A period is ASCII 46. We want to change it to a comma, which is ASCII 44. Line 30 modifies that character in the table. Then, in line 40, the pointer for the unshifted keys is moved to point to the brand new table at 6912. When you press the period on the numeric keypad, you'll get a comma instead. See the next letter for another idea.*

```
BQ 10 RAM=6912: ROM=64128
XP 20 FORJ=0TO88: POKERAM+J, P
      EEK(ROM+J): NEXT
AG 30 POKE RAM+82,44
CR 40 HI = INT(RAM/256): POKE
      {SPACE}830,RAM-HI*256: P
      OKE 831,HI
```

DATA and Commas

Many BASIC programs have an extensive DATA section. It would be easier for 128 users if a one-handed entry feature could be incorporated into "The Automatic Proofreader." I'd suggest that one of the function keys be reassigned to a comma (F1, maybe?). I don't have a machine language assembler/disassembler, and my ML is a little rusty, but the change should only be a few lines.

Charles F. Oller
Warwick, RI

You don't need ML. You can do everything in BASIC 7.0. Look up the two commands KEY and AUTO in your System Guide. If you want F1 to print a comma and F7 to print DATA, type these two lines:

```
KEY1,","
KEY7,"DATA"
```

If the DATA statements are numbered by tens, use the AUTO command to put the 128 into autonumbering mode. Type a line, press RETURN or ENTER, and the next line number will appear. Press F7 for DATA and F1 to print the commas between numbers.

Using "Countdown Timer"

I am trying to write a BASIC program that will determine typing speed. I'd like to use "Countdown Timer" from the April *GAZETTE*, but when it's running I can't type on the keyboard. How can I use the Countdown Timer to stop all keyboard entry after one or five minutes?

Steven Schulte
Long Beach, CA

From your description, it sounds like you're attempting to build your program around the five-line demonstration program included in the article. This demo displays the current internal clock reading as it counts down from one minute. Near the end of the article is a description of how to incorporate the Countdown Timer into your own BASIC programs.

To do this, you'll need to include the lines from Program 1 (for the 64) or 2 (for the 128) in your program. These lines POKE the ML routine into memory. Start up Countdown timer with SYS 679 on the 64 or SYS 3072 on the 128. Next, set the internal clock using the reserved variable TI$ (either TI$="000100" or TI$="000500").

Follow this with your typing input routine. Include a line near the end of the routine to check the timer. If it has wrapped around from "000000" to "235959" or something lower, the time is up and you can rate and display the user's typing speed. Otherwise, loop back to the beginning of the typing input routine.

Note that we didn't suggest that you look for exactly zero ("000000") on the timer each time through the loop. If you did this, chances are you'd miss it since the input routine may take longer than a second to execute.

Locating the Hi-Res Screen

I have a question regarding location 53272, which is used to select base addresses for bitmap mode on the Commodore 64. Most references I've seen will POKE 53272,29 (binary 00011101) to put the graphics screen at $2000 (8192) and color memory at $0400 (1024). The low nybble of this number is 13 in decimal. Shouldn't the low nybble be 8? POKEing a 29 in 53272 would seem to put the bitmap at 13*1024 (13312). Could you explain what they're doing here?

Wayne Dooley
Winchester, VA

Locations 53248–53294 are registers in the VIC-II chip, which is responsible for the 64's video display. The VIC chip can address only 16K of memory at a time. Data for anything shown on the screen must be located within this 16K of memory. Any of the four 16K blocks (0–16383, 16384–32767, 32768–49151, 49152–65535) can be chosen for video memory. Location 56576 (bits 0–1) determines which 16K video bank the VIC chip addresses.

The VIC chip register at 53272 does several different things. In text mode, it contains the offset address within the current video bank for the character set in the low nybble and the address for the text screen in the high nybble. The character set is 2K in length, so the low nybble (in bits 1–3) must hold an even number from 0 to 14, representing a 2K offset (since the number is always even, bit 0 is unused). Similarly, the text screen is 1K in length. So, bits 4–7 hold a number from 0 to 15, representing a 1K offset.

In normal bitmap mode, bits 4–7 still point to the offset address for the text screen. But in this case, the text screen provides color data for the graphics screen. As for the low nybble (bits 0–3) in this mode, only bit 3 is significant. It provides the 8K offset for the bitmap screen from the beginning of VIC memory. If this bit contains a 0, the offset is 0K, and if it contains a 1, the offset is 8K (8192).

Now, to consider your example. POKEing a 29 (binary 00011101) into 53272 sets bit 3. Assuming the VIC-II chip is in video bank 0 (0–16381), the bitmap screen is positioned at 8192 because bit 3 is turned on. The other bits in the low nybble are ignored. You could get the same result by POKEing a 24 (binary 00011000) into 53272.

Color memory for this hi-res screen is at 1024. A value of 1 is stored in the high nybble of 53272, and 1 × 1024 = 1024.

COMPUTE!'s Gazette is looking for utilities, games, applications, educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it to: **Submissions Reviewer, COMPUTE! Publications, P.O. Box 5406, Greensboro, NC 27403.** Please enclose an SASE if you wish to have the materials returned.

WORK WITH US ON A PROFESSIONAL LEVEL.

Some people really like working on their machines. And then there are some who prefer to do their tinkering under the hood. For those of you who can't wait to get your hands greasy, we proudly introduce geoProgrammer. The most sophisticated machine language programming tool on the market.

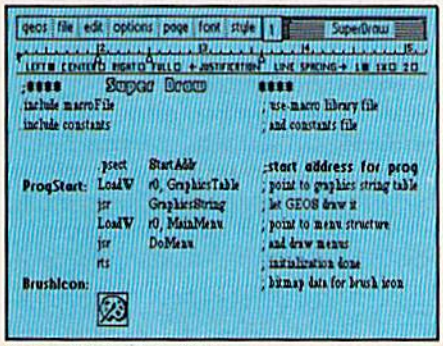
With geoProgrammer, you get the same kind of technology we use for developing our other products. Which means you can write supercharged software. Pump your own programs. And assemble just about any kind of application you can imagine.

It reads and writes and stomps on bugs.

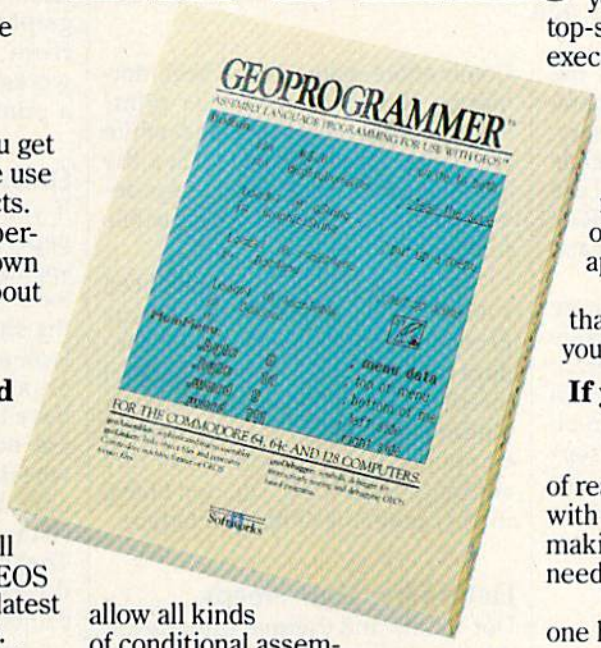
The first three tools that any serious programmer needs are an assembler, a linker and a debugger. So we've installed all three, complete with sample GEOS applications that teach you the latest programming tricks in seconds.

geoAssembler not only reads directly from geoWrite files, but contains enough Pseudo Ops to allow all kinds of conditional assemblies. It has all the state-of-the-art features you'd expect, including some you probably never thought possible. For example, integrating graphics is as simple as cutting and pasting the image from geoPaint directly into your program.

geoLinker ties your program modules together, supporting GEOS SEQ and VLIR applications and desk accessories. You can even use geoAssembler and geoLinker to create non-GEOS applications.



*Also available for 80 col. C128's.



geoDebugger allows your program to be tested in memory with full symbolic disassembly, along with line assembly for patching code in memory. It also allows your code to be single-stepped or top-stepped, with sub-routines fully executed. It can stop a running program with one key, or use up to eight conditional breakpoints. When your program hits the breakpoint, it prominently displays the error in an overlay window, leaving the applications screen intact.

Pro enough for you yet? Well, that's only a *partial* list of what you're in for.

If you understood all that, read on.

Chances are that we lost a lot of readers by now. But if you're still with us, hang in there. You have the makings of a real GEOS pro. All you need now are the right tools.

And all of them come in this one handy box.

So if you're serious about programming, consider geoProgrammer. After all, you've got nothing to lose —except your amateur status.

To order call 1-800-443-0100 ext. 234

geoProgrammer $69.95

(California residents add 7% sales tax.)

$2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.

Commodore, Commodore 64 and C128 are trademarks of Commodore Electronics, Ltd. GEOS, geoProgrammer and Berkeley Softworks are tradenames of Berkeley Softworks.

GEOPROGRAMMER

GEOS COMPATIBLE

Berkeley Softworks

The brightest minds are working at Berkeley.

Commodore-Ready Printers: A New Generation

Much More—For Less

Tom Netsel, Assistant Features Editor

Sales of more than seven million 64s and 128s have had a major impact on the printer market. The result: Printer manufacturers now offer 64 and 128 owners a wide choice of Commodore-ready printers that are filled with features undreamed of just a few years ago.

After a disk drive, a printer is the most popular computer peripheral bought by home computer users. About 65–70 percent of the people who buy a computer for personal use also buy a printer, according to Rick Lamb, product manager for Okidata, a major printer manufacturer.

For Commodore owners, there are more than 100 different printers on the market, made by 20 different companies, all listing for less than $500. Virtually any of them can be connected to a 64 or 128 with a separate printer interface. But it's not always a simple matter to achieve compatibility among printer, interface, computer, and software.

Uniquely Commodore

At one time, only a Commodore printer would connect directly to Commodore's unique serial port. There wasn't much of a choice, and special features were limited. Anyone who wanted underlining, multiple pitches, subscripts and superscripts, or a choice of type styles had to buy a printer with a standard Centronics parallel port. Then a separate interface was still needed to connect the printer to the 64 or 128.

As the base of Commodore owners grew, however, more and more manufacturers began offering ready-to-use printers packed with a full range of features. Now 64 and 128 owners have a wide choice of Commodore-ready daisywheel, dot-matrix, and thermal-transfer printers to handle their black-and-white and color printing needs. (See the accompanying buyer's guide for details about Commodore-compatible printers.)

Last year, Okidata introduced a universally compatible dot-matrix printer featuring both a Commodore serial and a Centronics parallel interface. The Okidata 180 is compatible with every major personal computer. If, for example, you buy an Amiga or IBM PC, you don't have to buy another printer or interface.

Determine Your Needs

Dot-matrix and thermal printers are the most popular choices among Commodore owners. Key ingredients to their popularity are versatility and low cost. Cost alone, however, should not be the deciding factor in choosing a printer. If a bargain printer doesn't meet your printing requirements, it isn't much of a bargain.

"Too many times the printer-purchase decision is dependent upon how much money is left over in discretionary income," Lamb says. "The buyer has $120 left, so he buys a $120 printer. Often there is some buyer remorse. After he lives with the print quality for a while, he realizes he needs something better."

Ask yourself what you want the printer to do. Decide how you plan to use the printer; then pick the one that has the features you need. If you primarily want to print graphics, you have different needs from those of the person who works with spreadsheets and needs a printer with 136 columns.

Daisywheels

If you write business reports, term papers, or other important correspondence requiring a professional look, a daisywheel printer offers the sharpest type. Your papers will look as though they've been typed on a quality typewriter, but you'll have to wait for them. Daisywheels are notoriously slow. Most daisywheels priced for the home market operate at speeds in the 10–20 cps (characters per second) range. That's fast for a human typist, but the daisywheel is the tortoise of the printer world.

The printing element of a daisywheel is a flat metal wheel that has approximately 90 spokes. It's about three inches in diameter, and gets its name from the fact that it looks something like a daisy. At the end of each spoke or "petal" is a bossed letter, number, or punctuation mark. As the wheel spins, the characters are pressed against a ribbon, which transfers ink onto the paper. You can buy additional printwheels if you want to change to a different style of type or a different font. Since its basic printing element is a fixed alphanumeric character, the daisywheel cannot print graphics.

If you're looking for quality type, and you don't need speed or

graphics-printing capabilities, then a daisywheel may suit your requirements. Blue Chip, Brother, and Silver Reed each sell Commodore-ready units. The Silver Reed EXP 420 and the Brother HR-10/C offer a choice of pitches in the 10–15 cpi (characters per inch) range. Their top speed is 12 cps, while the Blue Chip D 20/10 is a little faster, at 20 cps.

Paper Handling

The method used for feeding paper in and out of a printer varies between models. Friction-feed printers move paper around the platen somewhat the way a typewriter does, while tractor-feed printers engage the holes at the edge of fanfold paper. Tractor feeds are usually more reliable when it comes to handling long printouts on continuous or fanfold paper. Many printers offer both methods, but tractors are often sold as options.

Some models, such as the Seikosha SP-1000VC, have an automatic loading feature for single sheets of paper: When the paper is inserted behind the platen, the printer automatically advances it to the proper starting position. This feature can speed up long printing jobs. The NX-1000C from Star Micronics America comes in two Commodore-ready models. Each employs a unique paper-parking feature that allows users to feed single-sheet paper into the printer without removing tractor-fed paper.

Dot-Matrix Printers

If the daisywheel is the tortoise of the printer world, then the dot-matrix printer is the hare. This versatile machine offers speed plus the ability to produce complex graphic printouts. Instead of printing with preformed characters, dot-matrix printers use a row of vertical pins that strike the paper through an inked ribbon.

Dot-matrix printers generally fall into one of three printhead configurations: 9-pin, 18-pin, or 24-pin. Printers with 24 pins offer letter-quality type, as opposed to the near-letter-quality (NLQ) mode found on 9-pin printers. Their ability to print out letter-quality correspondence at 100 cps makes 24-pin printers popular in an office environment. Their relatively high cost, however, has limited consumer interest.

The Okidata 180 is compatible with every major personal computer.

Printheads with nine pins are the standard with the Commodore-ready models. A vertical column of nine pins prints across a page in both directions in draft mode, at speeds ranging from 100 to 180 cps. This process is considerably slower in NLQ mode.

An early drawback to dot-matrix printers was print quality. The printheads formed characters in a 5 × 7 or 8 × 8 matrix. There was often considerable space between the dots, making the letters look porous and ill-defined. Upgrades in printer electronics and printheads, however, have improved print quality tremendously.

Most printers now have several print modes. Draft mode is usually the fastest, but produces a rougher, fainter type. NLQ, or correspondence mode, takes longer to print, but it produces a more polished print quality.

NLQ is achieved in a variety of ways. Spaces between the horizontal dots of a letter can be filled in by printing the same column of dots twice while the printhead is traveling at half-speed across the page. This is sometimes called *emphasized type*. Spaces between vertical dots can be eliminated by making a second pass over the line after moving the printhead or paper half a dot vertically.

NLQ printing uses these multistrike techniques and special letter shapes to improve print quality. Unfortunately, improvements in one area often force a decline elsewhere. A tradeoff for improved print quality is a reduction in printing speed, by 50–300 percent. Most NLQ printing is done at speeds of 25–30 cps.

Until recently, changing from draft to NLQ mode required changing the printer's DIP switches. This often meant turning the printer around or opening an inside panel to access the switches. Then you had to check the manual for the proper sequence, since DIP switches were seldom marked. Most printers today simplify this chore by providing front panel buttons that allow instant access to frequently used print functions. You can switch from emphasized to double width to italics at the touch of a finger.

Some high-end printers allow the user to change fonts by plugging in ROM cartridges, but multiple fonts are also available on some printers in the Commodore price range. The Star NX-1000C Multi Font printer has four onboard fonts that are selected from the front control panel.

A Splash of Color

Another Commodore-compatible version of Star's Multi Font is the NX-1000C Rainbow. In addition to the multiple internal fonts, the Rainbow provides seven-color printing capabilities, and prints at 144 cps in draft mode and 36 cps in NLQ mode at 12 cpi. It prints black, red, yellow, blue, orange, green, and violet.

"We believe [the NX-1000C Rainbow] will be a significant factor in the Commodore market," says Brian Kennedy, product manager at Star Micronics. "It's going to be the lowest-priced color impact printer on the market."

The Rainbow can be used as a conventional printer for word processing and similar functions when color is not wanted or needed. "If you want to use it in the monochrome, or black-only mode, that's no problem," Kennedy says. "When you print out a hardcopy, just omit the color commands."

Barriers to Color

Printer manufacturers expect color to play an important role in the future of all printers. Several obstacles presently stand in the way. The first is the lack of color copiers. While they are available, the cost is prohibitive. A color printout may look great for a business presentation or meeting, but without the ability to make color copies, its value is greatly diminished.

Another obstacle is the lack of software support for color printers. Most printing packages simply do not support color printers. To circumvent this problem, Kennedy says the Rainbow recognizes embedded color commands. For example, if it sees ((C1)) in a letter or memo, the Rainbow recognizes that code and changes accordingly to color number 1.

"If you're typing a report and want a heading in a different color, type in ((C3)) followed by the heading," Kennedy says. "Then type in ((C2)) to change back to blue or black. You can embed these commands in any standard word processing or software package."

Kennedy notes that the average life of the color ribbons on a dot-matrix printer should be a couple of hundred pages. It can be considerably shorter on other types of color printers.

Thermal-Transfer Printers

Another Commodore-ready color printer is Okidata's Okimate 20. It uses a different print technology called the *thermal-transfer* process. Instead of using pins to strike an ink-coated ribbon, the Okimate 20 briefly heats the pins. The heat transfers to a ribbon coated with a waxlike ink that melts, forming a character on the paper.

The Star Micronics NX-1000C Multi Font includes four onboard fonts that are selected from the front control panel.

The thermal-transfer process has several advantages over the dot-matrix and daisywheel method. One is quietness. The Okimate 20 makes a slight whirring sound, and is practically silent compared to impact printers.

A third obstacle to the expanded use of color in printers is the high price tag—but not so with thermal-transfer printers. The Okimate, with a plug-in Commodore interface, has a suggested retail price of $268, while the dot-matrix Rainbow (which includes the multiple fonts) lists for $379. There are a few other color printers in the $500–$700 range, but then prices jump quickly to $6,000 and $7,000.

The Okimate 20 offers vibrant color and graphics capabilities.

"There's a big gap there," says Star's Rick Lamb. "Virtually all the large players are starting to add color to their line of printers, although very few are serial thermal-transfers such as the Okimate 20."

Another advantage to the color thermal-transfer process is its vibrant color. Dot-matrix printers put color to paper with ink, which lacks the high-gloss factor that wax achieves.

Unfortunately, thermal-transfer printers gobble up ribbons rather quickly, and they also require a very smooth paper for best results. A black ribbon may last for 75 pages of text, but expect only 10–15 pages when printing color graphics.

More Features in the Future

A few years ago, a basic dot-matrix printer cost about $500 and offered little in the way of extras. Now you can find models for half that price that are loaded with advanced printing features. There have been modest price increases recently on Japanese-made printers because of the dollar/yen exchange rate, but there are still many exceptional printers available at attractive prices for Commodore users.

"The number-1 thing to remain competitive," says Star's Brian Kennedy, "is to introduce

IT TAKES A LOT TO IMPRESS ME.

BRIAN DOUGHERTY
Software Designer/CEO
Berkeley Softworks

And Q-Link, the dynamic telecommunications service for Commodore® owners, does just that!

As the developer of GEOS, the graphics environment operating system for Commodore 64s and 128s, I know how good Q-Link is. Personally and professionally. Here at my company, we recommend Q-Link to all our customers. We use it ourselves, too, for online customer service . . . so you can get help when you need it. We've also found it's a very efficient way to provide upgrades and patches and to announce new GEOS-compatible products.

With just your Commodore, a modem and Q-Link software, a new world of personal computing options opens up: thousands of programs you can download and keep; advanced graphics (thanks to GEOS); an exclusive help line to experts at Commodore; online educational courses taught by real teachers; fun; games; friendship, you-name-it. Q-Link lets you realize the full potential of Commodore computing—right at your fingertips.

Do I use Q-Link? Absolutely! And what's really impressive is that when you join Q-Link, you get a modem and Q-Link Software free! To my mind that's a tough offer to turn down. But don't take my word for it. Find out for yourself. Call . . .

1-800-782-2278 ext. 1524

Call today to get your free modem and software.

Q-Link℠

8619 Westwood Center Drive
Vienna, VA 22180

new price/performance machines."

As manufacturers battle for a greater share of the printer market, printer buyers are reaping the advantages. And most manufacturers say this trend will continue.

As the prices of 24-pin machines come down, Kennedy believes they are going to force 9-pin machines out of the marketplace. "I think that over the next two or three years, 24-wire printers are going to come down so much in price that only the real down and dirty printers—in terms of price—are going to be 9-wires," he says.

Epson and NEC already have introduced 24-pin printers selling for $499. Breaking the $500 price barrier was a major step, and Kennedy expects to see them selling for $399 in a couple of years. In order to compete, 9-pin printers will have to sell for $299 and less. The 24-pin printers will be the standard for home users, and 9-pins will be bargain-basement items.

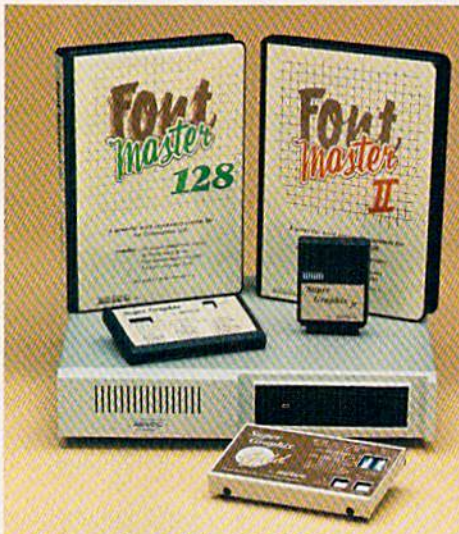
Looking to Lasers

On the other side of the coin, laser printers have come down in price so quickly that they are overtaking the high-end 24-pin market. Lasers print spectacular graphics and produce text at near-typeset quality. They are quiet and fast. Instead of being rated at characters per second, lasers are rated at pages per minute. Most of today's models crank out eight to ten pages per minute.

The street price for a Hewlett-Packard LaserJet Plus is around $1,500. That's only a couple of hundred dollars more than a 300–400 cps 24-pin printer. When people consider what an extra $200 can buy, most will lean toward the laser.

It may be a few years before the average 64 owner buys a laser printer, but the marketing battles in the high-end business environment ultimately filter down to benefit the home-computer user. Most industry representatives say these advances in technology and reductions in price will be passed on to the Commodore market.

"We have plans to support the Commodore for years because of its installed base," says Okidata's Rick Lamb. "There's still one heck of a lot of them out there."



Excellence...

for the Commodore

The Xetec Product Family

Look for the name that spells *Quality*, *Affordability*, and *Reliability*.

Lt. Kernal - a 20 or 40 Megabyte Hard Drive which supports CPM.

Super Graphix GOLD - the ultimate printer interface including a 32K buffer, 4 built-in fonts, a utility disk with 27 fonts and more.

Super Graphix - an enhanced printer interface including NLQ, an 8K buffer, reset button, a utility disk with 27 fonts and more.

Super Graphix jr - an economical printer interface with NLQ.

FontMaster II - a powerful wordprocessor for the C64 with 30 fonts ready to use, 65 commands, font creator and more.

FontMaster 128 - a super wordprocessor for the 128 including 56 fonts ready to use, a 102,00 word spell checker and much more.

All Hardware is FCC Certifed All Interfaces include a Lifetime Warranty

C64 and 128 are reg.TM of Commodore Business Machines, Inc.

Xetec 2804 Arnold Rd. Salina, KS. 67401 (913) 827-0685

COMPUTE! Publications SUBSCRIPTIONS

Magazines & Disks

1-800-727-6937

COMPUTE! Publications

Back Issues/Disk Orders

Individual back copies of *magazines* and *disks* are available by mail only while quantities last. Please clip or photocopy and mail completed coupon to:

COMPUTE!
Single Copy Sales
P.O. Box 5188
Greensboro, NC 27403

Name: _____

Street: _____

City: _____

State: _____ Zip: _____

Quantity	Issue (Month/Year)	Magazine or Disk Name	Price*

SUB TOTAL:
NY—Add 8¼% Tax:
NC—Add 5% Tax:
TOTAL:

* Magazine prices are $5.00
* Disk prices are $15.00
* Disk/Magazine combinations are $16.00

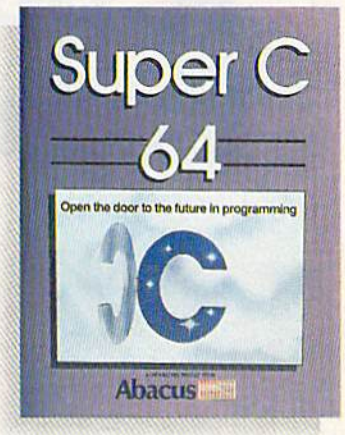
Shipping and handling included.
NO CREDIT CARD ORDERS ACCEPTED.

Get Results

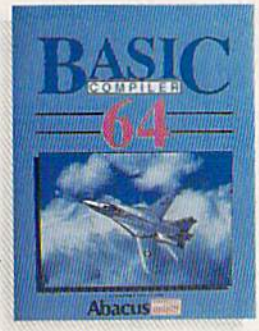
with proven software and books from Abacus.

Super Pascal—Get the fastest and complete Pascal for your computer. **Super Pascal** is a full implementation of standard Pascal. Extensive editor features search, replace, etc. Even add machine language routines with the built-in assembler. Fast graphics library. C-64 version has high-speed DOS for faster access. More than just a compiler–**Super Pascal** is a complete system that gives you programming results.
C-64 $59.95 C-128 $59.95

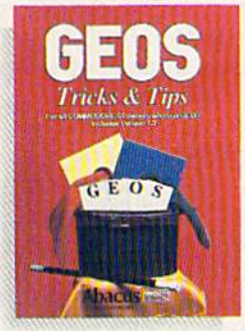
Cadpak—The professional design tool. Enter simple or intricate drawings with the keyboard, lightpen or 1531 mouse. With the flexible object editor you can create libraries of furniture, electronics, etc. as intricate as screen resolution permits. Zoom in to do detailed work. Produce exact scaled output to most printers in inches, feet, etc. Get design results fast with **Cadpak** and your Commodore® computer.
C-64 $39.95 C-128 $59.95



Super C—You can now develop software or just learn C on your computer. Easy-to-use and takes full advantage of this versatile language. Produces 6502 machine code and is many times faster than BASIC. Includes full-screen editor (search, replace and block operations), compiler, linker and handbook. Libraries for graphics and advanced math are included. Whether you want to learn C, or program in a serious C environment for your Commodore, **Super C** is the one to buy.
C-64 $59.95 C-128 $59.95



New!



BASIC Compiler— Now anyone can make their BASIC programs run faster! Easily converts your programs into fast machine language or speed code. Even speed up programs written in Simon's Basic, Video Basic etc. If your program walks or crawls, give it speed to RUN!
C64 $39.95 C128 $59.95

GEOS™ Tricks & Tips— A new book with something for everyone. Contains over 50 tricks and tips that you can use everyday. Converts any word processor file into geoWrite format; edit existing GEOS fonts or create your own; Write in machine language or explore the internals of GEOS. **$16.95**

New!

Amiga®!

TextPro Amiga is a full-function word processing package. Easy-to-use, fast and powerful—with a suprising number of extras. $79.95

BeckerText Amiga is the professional word processor. WYSIWYG formatting. Automatic creation of table of contents and index. Expandable spelling checker. Merge graphics into text. Much more. $150.00

DataRetrieve Amiga is the powerful, and easy-to-use database. Sets up in minutes. Password security. Large capacity. Performs complex searches. Very flexible. $79.95

AssemPro Amiga unlocks the full power of the Amiga's 68000 processor. Integrated Editor, Debugger, Disassembler and Reassembler. Cross-reference list. Conditional assembly. $99.95

Call (616) 698-0330 or write for your free Amiga software and book catalog. More software and books coming soon!

Please note our new address and phone numbers

Abacus

Dept. G1 • 5370 52nd Street SE • Grand Rapids, MI 49508
Phone 616/698-0330 • Telex 709-101 • Telefax 616/698-0325

Call or write today for your **free** catalog or the name of your nearest dealer. Or you can order direct using your Visa, American Express or MasterCard. Add $4.00 per order for shipping and handling. Foreign orders add $12.00 per item. 30-day money back guarantee on software. Dealer inquiries welcome—over 2400 dealers nationwide.

Commodore is a registered trademark of Commodore Electronics Ltd.
Amiga is a registered trademark of Commodore-Amiga, Inc.
GEOS is a trademark of Berkeley Softworks.

A Buyer's Guide to Commodore-Ready Printers

Mickey McLean

There is a good selection of printers designed to work specifically with the Commodore 64 and 128—with no separate interface required. This buyer's guide represents a comprehensive list and description of all those available. Included are categories describing speed, pitch, buffer, paper feed, graphics capability, warranty, and price. Be sure to see the previous article, "Commodore-Ready Printers: A New Generation," for more details.

Explanations of Terms

The following list contains definitions of terms used in the buyer's guide.

Compatibility. Because of Commodore's unique serial-data communications format, printers with standard serial or parallel connections will not work with a 64 or 128 without first being connected to a separate interface. All printers in this buyer's guide work directly with Commodore computers and do not require a separate interface. As noted in the buyer's guide, some of these printers are compatible with other formats as well.

Printer type. There are three types of print technology available for Commodore computers: daisywheel, dot matrix, and thermal transfer. Daisywheel printers form characters by striking the paper through an inked ribbon with a small wheel whose spokes have letters and numbers at their tips. Dot-matrix printers also use impact, but employ a printhead that contains either tiny wires or pins that form characters or graphics. A printer with thermal-transfer capabilities uses heat to melt a waxlike ink onto the paper.

Speed. In this category, users can determine how fast a printer prints. Most printers offer users a range of speeds measured in characters per second (cps). The slower modes can provide near-letter-quality printing (like a typewriter), whereas the faster modes produce rougher or fainter type in what is usually referred to as draft mode. Some printer speeds vary depending on the type of font used such as pica or elite.

Pitch. The pitch determines how many characters can fit on a line and is measured in either characters per inch (cpi) or characters per line (cpl). If larger- or smaller-than-normal characters are being printed, the pitch can vary.

Buffer. This is amount of text the printer can store while it is operating, allowing the computer to perform other work. Add-on buffers can be purchased to increase the printer's memory capacity.

Paper feed. The two basic feed types are friction and tractor. Friction-feed printers grip the paper and move it around the platen like a typewriter, while tractor-feed printers grab the holes at the edge of the paper with teeth at either side of the platen. Many printer manufacturers offer single-sheet feeders and additional tractors as optional equipment.

Graphics capability. Because of the limited number of characters on a daisywheel, printers with daisywheel technology cannot usually produce Commodore graphics characters. Dot-matrix and thermal-transfer printers do not have these limitations and therefore have the capability to print graphics.

Manufacturer Names and Addresses

Blue Chip Electronics
7505 W. Boston Ave.
Chandler, AZ 85226

Brother International
8 Corporate Pl.
Piscataway, NJ 08854

Commodore Business Machines
1200 Wilson Dr.
West Chester, PA 19380

Okidata
532 Fellowship Rd.
Mt. Laurel, NJ 08054

Seikosha America
1111 Macarthur Blvd.
Mahwah, NJ 07430

Silver Reed America
19600 S. Vermont Ave.
Torrance, CA 90502

Star Micronics
200 Park Ave., Suite 2310
Pan Am Bldg.
New York, NY 10166

Name	Manufacturer	Compatibility	Printer type	Speed (cps)	Pitch (cpi)	Buffer	Paper feed	Graphics Capability	Warranty	Price	Comments
D12/10	Blue Chip Electronics	Commodore interface included	Daisywheel	12	10	2K	Friction, tractor optional	No	6 months	$269	Comes with *Fleetwriter III* word processor
D 20/10	Blue Chip Electronics	Built-in Commodore and Centronics interfaces	Daisywheel	20	10	2K	Friction, tractor optional	No	6 months	$279	Comes with *Fleetwriter III* word processor
M 120 NLQ	Blue Chip Electronics	Commodore interface included, optional IBM/compatible cable	Dot matrix	25–120	10	2K	Friction and tractor	Yes	6 months	$299	Comes with *Fleetwriter III* word processor
HR-10/C	Brother International	Commodore serial, parallel	Daisywheel	12	10–15	2K	Friction and tractor	No	1 year for parts, 90 days for labor	$349	Optional keyboard converts printer into electric typewriter
MPS 1250	Commodore Business Machines	Commodore serial, Centronics parallel	Dot matrix	24–120	5–12	available	Friction and tractor	Yes	90 days	$299.95	
Okidata 180	Okidata	Commodore serial, Centronics parallel	Dot matrix	30–180	17	2K	Friction and pin, tractor optional	Yes	1 year	$329	
Okimate 20	Okidata	Serial, parallel (Commodore interface with Plug 'N Print Kit)	Thermal transfer	40–80	17	8K	Friction and tractor	Yes	90 days	$268	Color printing capabilities
1200 VC	Seikosha America	Commodore standard	Dot matrix	25–120	10–15	2.3K	Friction and tractor	Yes	2 years	$299	Fonts chosen from front panel
SP-1000 VC	Seikosha America	Commodore standard	Dot matrix	20–100	10–15	1.5K	Friction and tractor	Yes	2 years	$270	Includes linefeed and margin setting
SP-180 VC	Seikosha America	Commodore standard	Dot matrix	20–100	10–15	1.5K	Friction and tractor	Yes	2 years	$249	
EXP 420	Silver Reed America	Built-in Commodore interface	Daisywheel	12	10–15	1 line	Friction; tractor and sheet feed optional	No	90 days	$299	
NX-10C	Star Micronics	Commodore serial	Dot matrix	30–120	5–17	1 line	Friction and tractor	Yes	1 year	$349	
NX-1000C Multi-Font	Star Micronics	Commodore serial	Dot matrix	36–144	12	1 line	Friction, tractor, and single-sheet feed; optional automatic sheet feeder	Yes	1 year	$299	
NX-1000C Rainbow	Star Micronics	Commodore serial	Dot matrix	36–144	12	1 line	Friction, tractor, and single sheet feed; optional automatic sheet feeder	Yes	1 year	$379	Color printing capabilities

PART 1
"WESTERN EUROPEAN TOUR"
Scenery Disk is so beautiful to fly, you'll want to make it the centerpiece of your Scenery Disk collection! This is part one of a five-part guided tour from London to Moscow's Red Square.
We start out in London by flying over the Parliament building. Look closely and you can see the faces of Big Ben.
Our next view offers a glimpse of the majestic Tower Bridge and Tower of London at dawn. Other British highlights include Buckingham Palace, Westminster Abbey and Stonehenge.
Check back with us next month as we fly to Paris, France.
"Find Red Square" Contest!
Find Red Square in Moscow and enter to win a real trip for two to Europe. See the SubLOGIC Product Chart at your dealer or write SubLOGIC for complete details and contest rules.
subLOGIC Corporation
501 Kenyon Road
Champaign, IL 61820
(217) 359-8482 Telex 206995
ORDER LINE (800) 637-4983

DON'T SETTLE FOR LESS...

COMMODORE 64C

$149

1541II DISK DRIVE $169.95
1802C MONITOR $189.00

64C w/1541II Drive..... $317.00
64C w/SW41 Drive..... $259.00
1802C with either package..... $184.00

COMMODORE 128D

$439

- 128K Memory
- Built in 1571 Disk Drive
- Detatchable Keyboard

128D w/1084 Monitor..... $719.00
128D w/Thomson 4120 ..... $649.00

COMMODORE AMIGA

FOR ALL YOUR AMIGA NEEDS ... CALL tcp

512K RAM Upgrade.. $159.00
1010 EXT DRIVE $219.00
1680 MODEM $139.00

TUSSEY'S SPECIAL PACKAGES

GAME GALLERY

Educational Software too!
All Games stocked for quick ship!!!

ACCESS
Echelon	$29.95
Leader Board	$24.95
Leader Board Tourn. Disk	$16.95

ACCOLADE
Apollo 18	$19.95
Comics	$19.95
4th & Inches	$22.95
Hard Ball	$22.95
Killed Until Dead	$12.95
Miniputt	$24.95
Test Drive	$24.95

ACTIONSOFT
Last Ninja	$24.95
Thunder Chopper	$24.95
Up Periscope	$19.95

ACTIVISION
Air Rally	$24.95
Aliens	$22.95
Gamemaker Package with all Librarys	$39.95
Maniac Mansion	$27.95
Music Studio	$27.95
Shanghai	$24.95

AVALON HILL
NBA	$29.95

BRODERBUND
Lode Runner	$24.95
Moebius	$27.95
Superbike Challenge	$19.95
Ultima V	$39.95

CINEMAWARE
Defender of the Crown	$22.95
King of Chicago	$32.95
SDI	$27.95
The Three Stooges	$27.95

COSMI
Def Con 5	$17.95

DATA EAST
Commando	$17.95
Karate Champ	$24.95
Kid Niki	$19.95
Speed Buggy	$19.95

DATASOFT
Alt Reality/Dungeon	$24.95
Bismark	$24.95
Dark Lord	$19.95
Force 7	$19.95
Hunt For Red October	$32.95
Tobruk	$27.95
Tomahawk	$24.95
Video Title Shop	$25.95

BUY 2 GET 1 FREE!
Buy any two Electronic Arts Titles* Between April 1, 1988 and June 30, 1988 and get a third title
ABSOLUTELY FREE!!
* "Classic" Titles Do Not Quality

ELECTRONIC ARTS
Bard's Tale	$27.95
Bard's Tale II	$29.95
Chessmaster 2000	$26.95
Demon Stalkers	$24.95
Dragon's Lair	$19.95
Dungeon Runners	$19.95
EOS(Earth Orbit Stat'n)	$19.95
Instant Music	$24.95
Legacy of the Ancients	$19.95
Marble Madness	$23.95
Master Ninja	$24.95
Monopoly	$22.95
Outrageous Pages	$39.95
PHM Pegasus	$24.95
Roadwars	$24.95
Rockford	$24.95
Scrabble	$27.95
Skate or Die	$24.95
Sky Fox II	$24.95
Starfleet I	$29.95
Strike Fleet	$29.95
World Tour Golf	$27.95
Yeager AFT	$24.95

EPYX
500 XJ Joystick	$14.95
California Games	$24.95
Champ'ship Wrestling	$27.95
Create a Calendar	$19.95
Deystroyer	$24.95
Movie Monster	$16.95
Street Sports Baseball	$29.95
St Sports Basketball	$29.95
Sub Battle	$24.95
Summer Games	$16.95
Summer Games II	$26.95
Super Cycle	$14.95
Winter Games	$24.95
World Games	$29.95
World's Grtest Baseball	$24.95
World's Grtest Football	$28.95

FIREBIRD
Elite	$22.95
Guild of Thieves	$24.95
Knight ORC	$29.95
Star Glider	$24.95
The Sentry	$27.95

GAMESTAR
Championship Baseball	$27.95
Championship Football	$27.95
GBA Basketball 2 on 2	$24.95
Top Fuel Eliminator	$19.95

INFOCOM
Beyond Zork	$34.95
Hitchhiker's Guide	$22.95

LANCE HAFNER for the best in sports strategy simulation

3 in 1 Football	$29.95
Basketball, the Pro Game	$29.95
Final Four Basketball	$29.95
Full Count Baseball	$29.95

MICROLEAGUE
Baseball	$27.95
Wrestling	$24.95

MICRO PROSE
Airborne Rangers	$24.95
F-15 Strike Eagle	$21.95
Gunship	$22.95
Kennedy Approach	$17.95
NATO Commander	$24.95
Pirates	$24.95
Silent Service	$24.95
Solo Flight	$24.95
Stealth Fighter	$29.95

MINDSCAPE
Gauntlet	$29.95
Indiana Jones	$22.95
Indoor Sports	$22.95
Infiltrator II	$21.95
Paperboy	$24.95
Perfect Score:SAT prep	$44.95
Superstar Hockey	$24.95
Uchi Mata	$19.95
Uridium	$19.95

SIMON & SHUSTER
Star Trek: Promethian Adv	$24.95
Star Trek: Rebel Universe	$24.95
Typing Tutor IV	$29.95

SPECTRUM HOLOBYTE
Falcon	$22.95
Intrigue	$22.95
PT 109	$27.95
Soko Ban	$17.95

SOFTWARE SIMULATIONS
Football	$24.95
Pure Stat Baseball	$29.95
Pure Stat College BB	$32.95

SSI
B-24	$24.95
Eternal Dagger	$27.95
Phantasie I, III (each)	$24.95
Realms of Darkness	$27.95
Rings of Zilfin	$24.95
Roadwar Europa	$29.95
Shard of Spring	$24.95
Wargame Const Set	$22.95
Wrath of Nicademus	$27.95
Wizards Crown	$24.95

SUBLOGIC
Flight Simulator II	$32.95
Jet	$29.95
Stealth Mission	$37.95

64C BUSINESS AND PRODUCTIVITY

64C DATABASES
Bank Street Filer	$34.95
Data Manager II	$19.95

64C INTEGRATED PKGS
Vizastar 64 4K	$39.95

64C SPREADSHEETS
Swiftcalc 64 w/sideways	$19.95
Sideways	$19.95

64C WORD PROCESSORS
Bank Street Writer	$32.95
Font Master II	$34.95
Paperclip w/spellpack	$49.95
Paperclip III	$39.95
Pocket Writer Dictionary	$12.95
Wordpro 3+/64	$14.95
Word Writer 64 w/speller	$34.95

FINANCIAL & ACCT.
Timeworks Electr. Checkbk	$19.95
Timeworks Money Mgr	$19.95
CMS Acct Pkg/64	$119.95

MISC. HARDWARE
Estes pwr supply for C-64	$54.95
Naverone 3 Slot expander	$27.95

UTILITIES
Thinking Cap	$32.95
Toy Shop	$42.95
Copy II 64/128	$24.00
CSM 1541 align	$34.95
Fast Load	$24.95
Bobs Term Pro	$32.95

COMMODORE 128 SOFTWARE

WORDPROCESSOR
Fleet System 4	$56.95
Font Master 128	$44.95
Paperclip II	$54.95
Paperclip III	$39.95
Superscript 128	$59.95
Term Paper Writer	$34.95
Vizawrite 128	$CALL
Wordwriter 128 w/spell	$34.95

SPREADSHEETS
Swiftcalc 128 w/sideways	$49.95

DATA BASES
Data Manager 128	$34.95
Perfect Filer	$49.95
Superbase 128	$64.95

MISC. 128 SOFTWARE
Accountant Inc	$69.95
Bobs Term Pro 128	$47.95
CMS Acct Pkg/128	$124.95
Mach 128	$39.95
Partner 128	$54.95
Personal Acct. 128	$34.95
Sylvia Porter's Personal Finance Planner	$54.95
Vizastar 128	$CALL

GRAPHICS CORNER

Batteries Included	
Paperclip Publisher	$39.95
Berkeley Softworks	
GEO Publish	$44.95
Broderbund	
Graphics Library I,II or III	$16.95
Print Shop	$25.95
Electronics Arts	
Outrageous Pages	$39.95
Springboard	
Certificate Maker	$32.95
Clip Art	$19.95
Newsroom	$34.95
Timeworks	
Desktop Publisher	$39.95
Unison World	
Printmaster Plus	$29.95

tcp TUSSEY COMPUTER PRODUCTS

P.O.BOX 1006, STATE COLLEGE, PA 16804

...tcp SHIPS IT

PRINTERS

Panasonic Office Automation

2 yr warranty

1080iII .....$CALL
1091III .....FOR
1092i .....PRICING

star micronics inc

NX-1000 .....$169.95
NX 1000C .....$CALL
NX-1000R .....$CALL
(Rainbow Color Printer)
Call for latest price on
ND-10 ND-15
NB SERIES

SEIKOSHA

2 yr warranty

SP-180 VC $139.00
SP-1200 VC ....$CALL
SP-1200 AI....$169.00
120cps, NLQ Mode

CITIZEN

120D $144.95
180D $159.95
MSP-40 .....$294.95
Tribute 224.....$629.95

OKIDATA 180

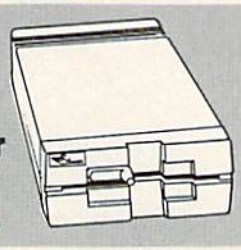
$229

- Built in COMMODORE® and EPSON® Interface
- 180 CPS Print Speed

Call For Other Okidata Printers

INTRODUCING ...

Swan Technologies Disk Drives
Commodore ® compatible



SW41

- Commodore ® 1541II compatible
- Full 1 year warranty

Suggested Retail ~~$169.95~~

$129

SW71

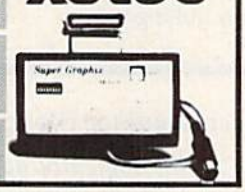
- Commodore ® 1571 compatible
- Full 1 year warranty

Suggested Retail ~~$249.95~~

$189

SUPER GRAPHIX JR Printer Interface ..... $39.95 w/Printer from Tussey $34.95	
SUPER GRAPHIX Interface w/8K buffer down loadable fonts ..... $59.95 w/Printer from Tussey $54.95	
SUPER GRAPHIX GOLD.. $99.95 w/Printer from Tussey $89.95	

Xetec



RGB/COMPOSITE COLOR MONITORS FOR THE 128

COMMODORE 1084
640 x 400 Resolution.
4 Operating Modes
.....$299.00

MAGNAVOX 8762
640 x 240 Resolution.
3 Modes. 2 yr warranty
.....$249.00

THOMSON 4120
560 x 240 Resolution.
4 Modes.1 yr warranty
.....$219.00

All 3 monitors include cables to Commodore 128

Berkeley Softworks

NEW!!... GEO PUBLISH (64/128).....$44.95

GEOS 128	$44.95	GEOS	$39.95
Geo Calc 128	$47.95	Geo Calc	$34.95
Geo File 128	$47.95	Geo File	$34.95
Geo Programmer	$49.95	Geodex	$27.95
Deskpack 128	$44.95	Deskpack	$22.95
Geo Write 128	$44.95	Fontpack	$22.95
Geo Spell	$24.95	Geo Write	$34.95

FEDERAL EXPRESS

Software orders over $100 and Accessories under 6 pounds will be shipped Federal Express

(Even at these prices) You only pay TCP's standard shipping charge of $4.00 per order. Orders arriving before 3:00 PM our time will be shipped out same day. If part of your order is backordered the remainder will be shipped UPS Ground FREE!

SECURITY

- Your Credit Card is not charged until your order is shipped.
- We insure your order at no extra cost to you.
- Tussey is a financially strong and well established company.

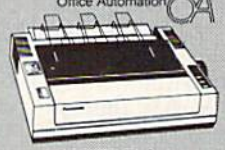
CUSTOMER SUPPORT

- After sales support.
- Knowledgeable staff, all graduates of Tussey's "Computer Boot Camp".
- Our advanced warehouse/materials handling system assures your order is shipped out accurately & on time.
- Our IBM 5360 allows instant order and inventory status.

To order by mail: We accept money order, certified check, personal check. Allow 2 weeks for personal & company checks to clear. **Shipping:** $4.00 for software FOR ALL HARDWARE AND ANY ACCESSORY OVER 6lbs Call our Toll Free Number 1-800-468-9044 for shipping charges. Add $3.00 per box shipped COD. Additional shipping required on APO, FPO, AK, HI, and foreign orders. **Terms: PRICES REFLECT CASH DISCOUNT, ADD 1.9% FOR MASTERCARD OR VISA.**
ALL SALES ARE FINAL
Defective items replaced or repaired at our discretion. Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice.

VISA MasterCard

Panasonic Office Automation



1080III Printer

- 120 cps (draft)
- NLQ Mode
- 2yr Warranty

CALL FOR BEST PRICE!

CMS

ACCOUNTING SYSTEM
Pkg. Price for all Modules:
C128 version.....$124.95
C64 version.....$119.95

COMMODORE
1670 MODEM $79.95

OCEANIC
FSD-2
DISK DRIVE
1541II Compatible
$149

COMMODORE
1764
256K RAM
EXPANSION
$119

COMMODORE
1581
3½" DISK DRIVE
$197

Digital Solutions Inc.

Pocket Writer 2	$42.95
Pocket Filer 2	$39.95
Pocket Planner 2	$39.95
Digital Superpak	$74.95
Dictionary	$12.95

DISKS
per box of 10
BONUS DISKS
SS/DD $6.45
DS/DD $6.95
TUSSEY DISK CLOSEOUTS!!!
SS/DD $4.49
DS/DD $4.99
Call for Price on Verbatim and Maxell Disks!!

Regular Hrs: 8:00AM-9:00PM Mon-Fri, 10:00AM-6:00PM Sat, 12:00PM-8:00PM EST

CALL TOLL FREE 1-800-468-9044

tcp

FOR INFORMATION CALL 814-234-2236 FAX: 814-237-4450

Super Snapshot 3.0 and Slideshow Creator

The 64 utility-cartridge war has intensified markedly in the past year. I recently counted at least ten "fast load plus" cartridges on the market. Several, including Super Snapshot, are in their third incarnations. Though one of the most technologically advanced, even a quality product like Super Snapshot needs something special going for it in a crowded market. And this "something special" is a gem of a companion: Slideshow Creator.

Dependent entirely on the cartridge for slide preparation, Slideshow's Projector program does not require Super Snapshot to run. Essentially, Slideshow Creator enables you to turn *DOODLE!* and/or *Koala Paint* images into a series of "slides," either in a stand-alone show, or as part of your own BASIC or machine language program. (Demos are included illustrating *all* possibilities.) All applications should be easily understood by intermediate programmers.

One of Super Snapshot's many fine features is its screen copy (dump) capability, which permits any screen (minus sprites—we are promised these in version 4.0) to be captured on disk as a *DOODLE!* or *Koala* file, among other formats. Screen dumps can also be sent in three sizes, and in normal or reverse format to a variety of printers.

Once saved, screens can be modified by their respective programs. Slideshow allows for sequencing any set of *DOODLE!* or *Koala* images, specifying their timing, and entry/exit mode (wipes). It also offers a scrolling text overlay option.

Scrolling text (which can be quite long) is either of two sizes, in any of ten fonts, and may be placed anywhere on the screen. (It can appear either in front of or behind the graphic, in a variety of user-specifiable colors.) The show itself can be set either to run once and stop or to repeat infinitely. To display a large number of slides, up to four disk drives of any type may be chained together.

Slideshow Creator is a versatile program. It's highly appropriate for window displays and for both business and educational presentations. This ability alone is nearly reason enough to purchase a Super Snapshot cartridge (the combination costs less than $70).

Super Snapshot has many other features going for it as well. With a 32K ROM and an 8K RAM, it—uniquely among utility cartridges—permits plug-in ROM upgrades. Company policy is to upgrade cartridge ROM for $20 plus $3 shipping and handling; all you do is send in your old cartridge. (The original Snapshot 64 is not upgradable). It replaces the ROM (you can do it yourself as easily), and includes the current "parameters" disk and documentation, which is quite good.

Super Snapshot is one of the most technologically advanced cartridges for the 64—and it has a gem of a companion: Slideshow Creator.

Users familiar with version 2.0 should be aware that 3.0 is a significant upgrade. Among the many new features are turbo save and a faster turbo load. (Now, 60 blocks load in 6 seconds instead of 8.5, and we are promised further improvement in version 4.0.) Version 3.0 includes turbo routines unique to the 1571 drive. (The manual shows how to use these even on the 64). Also, there is sprite collision disabling (several varieties), and an Extended Life function that locks in your attained level in a game. Should a game "death" occur, upon restart, the game resumes at the previously attained level. This is one of several reasons for the on-board 8K RAM. Indeed, dedicated hacker/gamers can freeze a program at any point, enter the machine language monitor, modify code, and return to the running program with memory otherwise uncorrupted. This is a capability unique to Super Snapshot.

One of the features I particularly like is the easily programmable function keys. Cartridges typically offer preprogrammed keys, but this is the only one I've seen that allows you to modify them. And who doesn't want to change one or two? Particularly well-designed is function key loading from an on-screen disk directory, accessible via another function key. (I only wish that a DSAVE command made saving from a directory as simple.)

The cartridge contains so many useful features, I cannot begin to name them all. Two, however, merit special mention: the accessible—through the ML monitor—and user-friendly track-and-sector editor, and the turbo file and disk copy utility. The file copier permits fast copying of selected files from any model disk drive to any other, including the 1581. (Turbo and copy utilities for the 1581 are rare.) The disk copier purportedly copies disks between like drives only. I could not test this copier; my review ROM lacked this feature.

A parameters disk—the latest one from Kracker Jax—is included with Super Snapshot for those relatively few programs the cartridge cannot back up by itself. (According to the publisher, Software Support International, no cartridge can back up all programs.) The disk includes both a nibbler for programs that require one (Kracker Jax identifies them) and a set of disk-based Turbo*25 utilities that permit you to reformat your backups—on the 1541 only—and to load very fast, with or without Super Snapshot.

Every reviewer has a wish-list of desirable features, and I am no exception. I miss a set of BASIC aid utilities, a reset button available during system crash, and an OLD command to recover a lost BASIC program. On the other hand, a complete disk wedge is always available, even at snapshot time. This wedge, turbo load and/or save, and the programmed function keys may be turned on or off at any time. I would also appreciate a turbo Scratch and Validate to go with the fast Format, Load, and Save (maybe in 4.0?).

There's a lot of power in these two packages. Both are well-designed and packed with useful features. Software Support International (formerly Com-

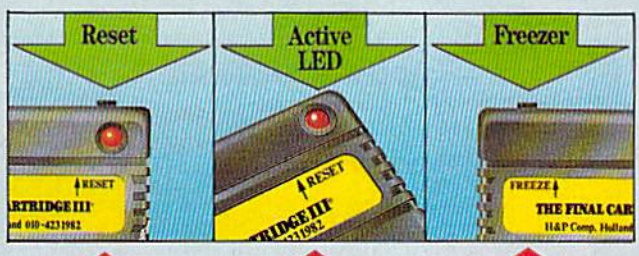
KEEP IT SIMPLE!

THE FINAL CARTRIDGE III

A POWERFUL 64K ROM BASED OPERATING SYSTEM FOR THE C64 AND C128

Easy to use WINDOWS and PULL DOWN MENUS allow you to select with either mouse, joystick or keyboard more than 60 new COMMANDS and FUNCTIONS. Various PRINTER-INTERFACES, a BASIC TOOLKIT

Comfortable ML MONITOR including 1541 drive access and sprite-editing, a NOTEPAD/WORDPROCESSOR with proportional characters, 2 DISK LOADERS with speeds, up to 15 times faster and a state of the art FREEZER. Transform your Commodore into a complete new - AMIGA LOOK ALIKE - system.



WINDOWS

THE FINAL CARTRIDGE III

The high-resolution bit mapped windows are selected from a menu bar. An unlimited number of windows can be open on the screen at the time. The windows can be freely moved on the screen.

The following windows are already implemented in ROM:

PREFERENCE WINDOW
Selects: mouse port, joystick port, mouse speed, screen colours, pointer clours, keyboard click, keyboard repeat.

CALCULATOR
Complete simulation of a LCD-calculator. Input either with mouse, joystick or keyboard. The numeric key-pad of the C128 can be used in C64-mode.

NOTE PAD
Easy to use wordprocessor with proportional characters enables you to store and print small notes, letters, etc.

DIRECTORY WINDOWS
Enables you to open directories from different disks and drives, sort and print directories.

DISK WINDOWS
Load, Run, Rename, Validate, Scratch, Initialize, Fast format disks.

TAPE WINDOW
Activates fast and normal modes.

PRINTER WINDOWS
Select different printers, such as Commodore serial, Centronics, RS 232, Colour printers.

REQUESTER WINDOWS

DISC BASED USER WINDOWS

CLOCK
Real Time Clock, with Alarm.

FREEZER MENU

THE FINAL CARTRIDGE III

Innovative hardware, combined with smart software, allow you to freeze and continue every well-known C64-program.

Freezer options include:

CENTRONICS/SERIAL/RS 232 SCREENDUMPS
● Full A4 printing ● Variable printsize ● Colour printing ● Sprite printing ● Reverse printing ● Colour changes.

GAMEKILLER
● Kills sprite to sprite ● and/or sprite to background collision ● Can be started at any point in your game.

AUTO FIRE
● Transforms a normal joystick to an advanced auto fire engine.

JOYSTICK PORT CHANGER
● Never blow up your computer again by changing joystick ports while the C64 is running.

BACK UPS
● Disk to disk ● Tape to disk ● Disk to tape ● Back up files are packed and reloadable without the Final Cartridge III ● 60K in 15 sec. (disk) ● Exits to Monitor or Basic.

ML MONITOR
Comfortable ML monitor.
Does not reside in memory.
Functions include:
● Scrolling up and down ● 64K ROM/RAM access ● Sprite editor ● Character editor ● Drive monitor ● Fast loading and saving ● Printer driver.

PULL DOWN MENU

THE FINAL CARTRIDGE III

Almost all commands and functions that are not activated by windows can be selected from a menu bar, which appears on top of the screen after pressing the fire button, either in Basic or from the freezer. The following Basic Toolkit and keyboard extra's are included:

● Renumber ● Auto ● Delete ● Old ● Help ● Kill ● Find ● Replace ● 24K extra RAM for Basic ● Append ● DAppend ● DSave ● DOS ● Monitor ● Drive monitor ● Sprite editing ● Centronics interface ● Fast format ● Low Res screen-dumps ● Plist ● Scrolling up and down ● Stops and continues listings ● Programmed functionkeys ● Packer/Cruncher ● Hex to decimal conversion ● Pokes, syscalls and variables may all have Hexadecimal values ● Trace, Dump, Order, Mem.

FINAL CARTRIDGE is a super powerful Utility/Backup Cartridge to give your 64/128 **AMIGA LOOK-A-LIKE SCREENS** Plus backup power and unmatched Toolkit!

When reviewing **FINAL CARTRIDGE III, Comodore Computing International said,** "This product is so versatile, so easy to use, it deserves the highest commendation. If you want probably the best utility around check out **FINAL CARTRIDGE III**."

ONLY $59.99
Add $3 Shipping & Handling

HOW TO ORDER

BY PHONE	BY POST	BY TELEX/FAX
24 hr Credit Card Line	Send checks/PO's made payable to 'Datel Computers'	Telex Orders: 6503441417 MCTVW Fax Orders: (702) 454 7700) After 7.30 pm

DATEL COMPUTERS

DATEL COMPUTERS, 3430 TROPICANA AVENUE, UNIT # 67 LAS VEGAS, NV 89121

SALES ONLY	TECHNICAL ONLY
1-800-782-9110	(702) 454 7700

TOTAL BACK UP POWER TAKES A QUANTUM LEAP!

ACTION REPLAY IV THE ULTIMATE UTILITIES/BACK-UP CARTRIDGE FOR THE 64/128

• Action Replay allows you to Freeze the action of any memory Resident Program and make a complete back-up to disk or tape – but thats not all . . . . Just compare these features

- Simple Operation: Just press the button at any point and make a complete back-up of any* memory resident program to tape or disk.
- Turbo Reload: All back-ups reload completely independantly of the cartridge at Turbo speed.
- Sprite Monitor: View the Sprite set from the frozen program – save the Sprite – transfer Sprites from one game to another. Wipe out Sprites, view the animation on screen. Create custom programs.
- Sprite Killer: Effective on most programs – make yourself invincible. Disable Sprite/Sprite/Backround collisions.
- Unique Picture Save: Freeze and save any Hires Screen to tape or disk. Saved in Koala, Blazing Paddles Format.

ONLY $59.99

POWERFUL DESIGN WITH ON BOARD LSI LOGIC PROCESSOR CHIP PLUS 40K OF ON BOARD ROM/RAM!

- Compactor: Efficient compacting techniques – 3 programs per disk side – 6 programs if you use both sides.
- Single File: All programs saved as a single file for maximum compatibility.
- Utility Commands: A host of additional commands: – Autonum, Append, Old, Delete, Linesave, Printer-lister
- Screen Dump: Print out any Screen to Host or Printers. 16 Gray Scales, Double size print options.
- Unstoppable Reset: Reset button to Rectrieve System and Reset even so called Unstoppable Programs
- Fully Compatible: Works with 1541/C, 1581, 1571 and Datacassette with C64,128, 128D (in 64 Mode)
- Compatible: With Fast DOS and Turbo Rom Systems
- Disk Utilities: Fast Format, Directory, List, Run and many other key commands are operated by Function Keys

- Unique Restart: Remember all of these utilities are available at one time from an integrated operating system. A running program can be Frozen to enter any Utility and the program is restarted at the touch of a key – without corruption

LSI Logic Processor: This is where Action Replay IV gets it's power. A special custom LSI chip designed to process the logic necessary for this unmatched Freeze/Restart power. No other cartridge has this power!

UNIQUE FEATURES:

WARP 25

Loads 50K in under 5 seconds!!

The it true action replay features 'Warp 25' the world's fastest disk serial Turbo. A typical backup will reload in under 5 seconds.
● No additional hardware required ● No special formats ● Super reliable ● Remember this is not a system where files have to be converted – with action replay you simply save directly into Warp 25 status – reload in seconds. ● Backup all your existing programs to load at unbelievable speed!! ● Because AR4 has on board ram it can also load commercial disks directly at 25 times speed.
This is unique to Action Replay!!
● Warp Save/Load Available straight from Basic.

Plus unique Code Cracker Monitor

● Freeze any program and enter a full machine code monitor ● Full Monitor Features – Disassemble, Hex, Find, Jump, Compare, Replace, Two Way Scroll, Full Disk Load/Save, Printer Support etc. In fact all usual monitor commands plus a few others. ● Because of Action Replay's on Board Ram the Frozen program can be looked at in it's ENTIRITY – In it's Frozen state. That means Video Ram, Zero Page etc. and remember you see the code in it's Frozen state not in a Reset state as with competitors products! ● Restart the program at any point ● No corruption ● An absolute must for the program Hacker – make changes and see your result's instantly!

PLUS SUPPORT UTILITIES

Action Replay Graphics Support Disk

To help take advantage of action replay's unique power to freeze any screen and save it into your favourite graphics package we have prepared a suite of graphic support facilities.
● **Screen Viewer** View screens in a 'slide show' sequence – Joystick control simple to use. ● **Message Maker** Add scrolling messages to your saved screens with music, very easy to use. ● **Prosprite** A full sprite editor, modify/save/load feature, full edit facilities. ● **Zoom Lens** Explode sections of any saved screen to full size including Border – Superb fun and very useful.

ONLY $14.99

Action Replay Parameter Support Disk

Action Replay can backup any memory resident program plus the majority of multiloading disks. To further enhance your ability to backup the small number of tricky programs we have a number of useful utilities and tips to help, these include a disk nibbler, track sector editor, special file copier, plus a number of others. A must for the dedicated cracker.

ONLY $14.99

* In our most recent test we were unable to find any program that AR4 could not cope with.

ORDERS ONLY

1-800-782-9110

NOTE: – Technical or any other type of Enquiry cannot be answered by the staff on this number.

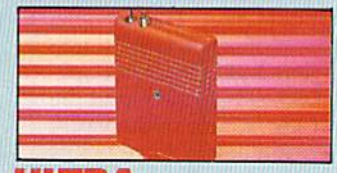
FAX: (702) 454 7700 (After 7.30 pm)
TELEX: 6503441417 MCIVW
TECHNICAL/OTHER ENQUIRIES
(702) 454 7700
5.30pm to 7.30pm (Pacific Time) and Sat - Sun

DATEL COMPUTERS

256K SUPEROM EXPANDER

- Now you can select from any of 8 32K EPROMs instantly.
- 8 sockets to accept upto a 32K EPROM in each.
- On board operating system – no programs to load.
- Program your own EPROMs using our EPROM programmer.
- No need to have loads of cartridges – just make a selection from the Superom menu.
- Directory of utilities on power up.
- Fully menu driven on power up.
- Select any slot under software controls.
- Unique EPROM generator feature will take your own programs – basic or m/c and turn them into autostart EPROMs. (EPROM burner required).
- Accepts 2764/27128/27256 EPROMs.
- On board unstoppable reset.

ONLY $49.99



ULTRA CRUNCHER

• The ultimate cartridge based program compactor.

- Compact by upto 30%!
- More programs per disk.
- 3 compacting programs on one cartridge
- Fast loading/saving routines – works with Disk Demon
- Can even further compact AR III files!
- 250 block file copy function
- Full DOS support including fast format

ONLY $24.99 COMPLETE

OR $14.99 ROM ONLY

DUPLIKATOR™

- Copies whole disk in one pass – only one drive required!
- Makes back-up copies in eight seconds!!
- Duplikator is the fastest, most efficient and easiest to use disk copying system ever conceived.
- Comes complete with 256K on-board ram and it's own operating system – no software to load.
- Makes multiple copies from one original.
- Full disk verification during back-up process.
- Copies standard software as well as errors 21-29 and upto 40 tracks.
- Full disk error check in eight seconds.
- Full disk verify against ram in fifteen seconds.
- A must for clubs, user groups etc. How else can you copy over 250 disks an hour for less than $200.
- Comes complete with on/off switch and reset button.
- Fitted in minutes – no soldering usually required.

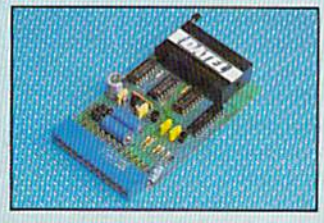
ONLY $159.99

TURBO ROM II

Turbo Rom II is a replacement for the actual kernal inside your 64. It provides superfast load/save routines.

- Loads/Saves most programs at 5-6 times normal speed.
- Improved DOS support including 10 sec format.
- Programmed function keys:- load, directory, old, etc.
- Return to normal kernal at flick of a switch.
- FCOPY – 250 block file copier.
- FLOAD – special I/O loader.
- Plus lots more.
- Fitted in minutes – no soldering usually required. (On some 64's the old ROM may have be desoldered).

ONLY $24.99



EPROMMER 64™

- A top quality, easy to use EPROM programmer for the 64/128.
- Fully menu driven software/hardware package makes programming/reading/ verifying/ copying EPROM's simplicity itself.
- Will program 2716, 2732 2764, 27128 and 27256 chips. 12.5, 21 or 25 volts.
- Fits into user port for maximum compatibility with cartridges/Superom Board etc.
- Full feature system – all functions covered including device check/verify.
- We believe Eprommer 64 is the most comprehensive, most friendly and best value for money programmer available for the 64/128.
- Ideal companion for Superom Board. Cartridge development System, our kernal expanders or indeed any ERPOM base project.
- Comes complete with instructions – plus the cartridge handbook.

ONLY $69.99 COMPLETE

TOOLKIT IV

The ultimate disk toolkit for the 1540/1541

- A disk toolkit is an absolute must for the serious disk hacker. Toolkit IV has more features than most for less.
- DISK DOCTOR V2 – Read and write any track and sector including extra and renumbered tracks. Repair damaged sectors. Look underneath read errors.
- HEADER/GAP EDITOR – Decodes and displays ALL header information including off bytes and header gap. Rewrite the entire header and header gap. Renumber sectors. Also edit any sector tail gap.
- DISK LOOK – Sort directory. Recover lost files. Display file start/end addresses. Disassemble any file program directly from the disk to SCREEN or PRINTER including undocumented opcodes. Edit Bam. Much, much more.
- FILE COMPACTOR – Can compact machine programs by up to 50%. Saves disk space. Compacted programs run as normal.
- FAST DISK COPY – Copy an entire disk in 2 minutes or less using single 1541.
- FAST FILE COPY – Selective file copy. Works at up to 6 times normal speed.
- FORMATTER – 10 second format an entire disk or format any individual track or half track 0 to 41. Redefine any of 30 parameters to create or recreate unique disk formats.
- ERROR EDIT – Quickly find and recreate all read errors including extra and renumbered tracks or sectors and half tracks from 0 to 41. Even recreates data under errors and allows you to redefine any necessary parameters.

ONLY $14.99

DEEP SCAN BURST NIBBLER™

The most powerful disk nibbler available anywhere, at any price! Burst Nibbler is actually a two part system – a software package **and** a parallel cable to connect the 1541/1570/1571 to 64/128 (state type). What gives Burst Nibbler its power? Conventional nibblers have to decode the data from the disk before it can transfer it using the serial bus – when non standard data is encountered they are beat. Burst Nibbler transfers data as raw GCR code via the parallel cable without the need to decode it so you get a perfect copy to the original. Will nibble upto 41 tracks. Copy a whole disk in under 2 minutes. Full Instructions. Regular updates – we always ship the latest. Fitted in minutes – no soldering usually required. Full or ½ tracks. No need to buy parallel cable if you have Professional DOS etc. Cable has throughbus extension for other add ons.

ONLY $39.99 COMPLETE

SOFTWARE ONLY $19.99

CABLE ONLY $19.99

BURST NIBBLER PARAMETER DISK

Burst Nibbler is the most powerful Nibbler around – but even the best can be better. This disk contains dozens of parameters specially written for the protection schemes impossible to Nibble. These are mainly 'V-max' and 'Rapidlock' and include titles such as 'Defender of the Crown' Gauntlet etc. Regularly updated to include any new titles. This disk is by no means a necessity – the standard Burst Nibbler will copy 98% of software as is – if you want to go to the limits, this is the product for you!

ONLY $14.99

EXTERNAL 3.5" DISK DRIVE

- Slimline extra low profile unit – only 6" long!
- Top quality NEC drive mechanism. • Throughport allows daisychaining other drives. • A superbly styled case finished in Amiga colours. • Fully compatible. • 1 meg unformatted capacity. • Good length cable for positioning on your desk etc. • Complete – no more to buy.

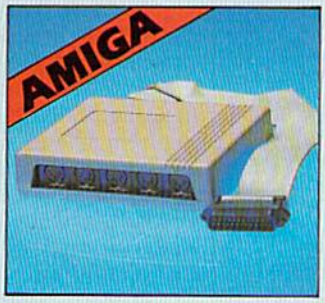
ONLY $169.99

512K RAM EXTENSION • A500

- Available with/without calendar clock option.
- Simply plugs internally into A500 slot. • Switch in/out with switch supplied. • Fitted in minutes – no soldering etc.
- With calendar/clock onboard time/date automatically booted. • Battery backed to retain time/date.

ONLY $119.99 for standard 512K card or

ONLY $139.99 for version with clock/cal.



MIDIMASTER

- Full Midi Interface for A500/2000/1000 (Please state model).
- Compatible with most leading Midi packages (inc. D/Music).
- Midi In – Midi Out x 3 – Midi Thru.
- Fully Opto Isolated
- No need to p r more – Full Midi standard.

ONLY $49.99

VISA®

MasterCard

Add $4.00 Shipping/ Handling

CHECKS/ MONEY ORDER/ CODS ACCEPTED.

DATEL COMPUTERS
3430 E. TROPICANA AVE., UNIT #67
LAS VEGAS
NV 89121

puter Mart) is an aggressive company that believes in its products and is ready to offer both user-support and up-to-the-minute technology. It adds up to a winning combination.

—Art Hunkins

Software Support International
2700 NE Andresen Rd.
Vancouver, WA 98661
Super Snapshot 3.0
$54.95
Slideshow Creator
$14.95

Kung-Fu Master

Data East is becoming a major source of games centering on Eastern martial arts. After my initial disappointment with the action and graphics found in two other Data East products—*Karate Champ* and *Kid Niki*—I was beginning to think that there was nothing of interest to be found in this genre.

It was with pleasant surprise that I discovered *Kung-Fu Master*.

In this newest offering from Data East, you'll find realistic action, cunningly designed enemies that include stylized dragons and snakes, dwarfs, henchmen, guardians, killer bees, and jars and exploding globes raining from the sky. You would be well advised to buy a high-quality joystick. You'll need it because the action is so frantic you'll find yourself trying to wrench the joystick in four directions at once. (You can also play with keyboard joystick emulation.)

When the game begins, you'll see a demonstration game. Press any key to see the options screen. You have the option of playing against an opponent (actually you'll just trade off control of the central character) or of playing alone.

Next, select your level of play. There are five floors in the wizard's temple, where you have come to rescue a maiden, and the five levels of difficulty correspond to these floors. The level of difficulty represents the number of enemies coming after you.

The third option is whether to play the game with the selected options or to return to change the options already mentioned. Once again, press RETURN to continue. When you are on the level you want, you can begin play after a loss by pressing RETURN four times. You'll probably lose often at first, so this procedure will quickly become a part of the game's rhythm.

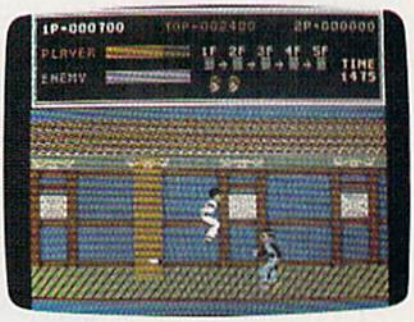
Buy a high-quality joystick. You'll need it because the action is so frantic.

In the first frame of the first level, jars and globes fall from the sky. They can be destroyed in midair. If they reach the ground, they burst to reveal dragons and snakes. Some globes float a moment and then explode into clouds of deadly shards.

You cannot kill the snakes, but they can kill you, so you should leap over them. Attacking a dragon is very dangerous. They breathe flames, which you must avoid. Squat and kick for best results. Move quickly, because the dragons disappear after the flames go out.

Henchmen approach you individually and in groups. They appear to be unarmed, but they can destroy you if they get their hands on you. Shrug off their life-draining grip by rapidly turning from side to side. It will save your life, but you'll earn no points for such a maneuver. You can keep tabs on your strength, and the enemy's strength as well, by watching the bar displays at the top of the screen.

To earn points, you must kick or punch the enemy. This concept is deceptively simple. The fact is that, just as in real martial arts, you must develop a sense of space around yourself. When a henchman (or any one of the dozen or so other threatening obstacles) enters that space, you must react instantly. If the enemy is too close or too far away, your aggression will have no effect.



You can select kicking or punching by pressing the space bar. You can kick or punch on any of three levels: standing, squatting, or leaping. For example, you can leap over or squat-kick dwarfs. If one grabs your legs, switch the joystick rapidly from side to side until the dwarf falls off the surface of the earth.

Generally, you'll earn more points for defeating someone with a punch or a jumping kick than with a standing or squatting kick. Points, however, will be a secondary consideration to survival until you become very good at this game.

Guardians are the most resilient characters in this game, and they are armed. Somehow you have to avoid being stabbed by flying knives or destroyed by bats as you kick or punch the guardian repeatedly.

You must battle your way to the stairs at the end of the corridor before the timer counts from 2000 to 0. The stairs lead you to the next floor, where you will be given additional time and energy. You begin with three lives, but you can earn extra ones for each 40,000 points scored. To earn points rapidly, concentrate on killing dragons, floating globes, and bats.

The pause feature is most welcome— especially in a game so frenzied as this one. Another impressive feature is the ability to move in both directions. Many action games allow you to move right to left or left to right, but steadfastly refuse to move in the opposite direction (*Kid Niki* and *Bazooka Bill* are two examples). *Kung-Fu Master* can move away from or toward the objective, which makes the game just a little more realistic.

If you want fast, unrelenting action (and particularly if you have been disappointed by other oriental combat offerings), *Kung-Fu Master* is the martial arts game you've been waiting for.

—Robert Bixby

Data East
470 Needles Dr.
San Jose, CA 95112
$19.95

MAIL TO:
COMPUTE!'S GAZETTE SUBSCRIBER SERVICE
P.O. Box 10958, Des Moines, IA 50340-0958

Change of Address: Please advise as early as possible. Attach label with your old address and write in new address below.

New Subscriber: Fill in your name and address below. Use separate sheet for gift orders.

PLACE LABEL HERE

Renewal: Attach label.
.....One year $24.00 ..... Two years $45.00
(Foreign subscribers please add $6.00 per year for postage)

NAME .....

STREET .....

CITY/STATE/ZIP .....

..... Please bill me..... Payment enclosed

For other subscription questions or problems, please write a note and send entire form to the above address, OR CALL TOLL-FREE:

1-(800) 727-6937

Tetris

It arrived during the first week of the Olympics. It was a simple-looking game in a red-and-yellow box. I looked it over excitedly thinking, "Aha! Here's a chance for at least someone to get even with the Soviets!"

So I thought.

Coutesy of Spectrum Holobyte, *Tetris* is the first game to arrive in the United States from the U.S.S.R. This intriguing and deceptive game was invented by a young Soviet researcher currently working at the Computer Centre (Academy Soft) of the U.S.S.R. Academy of Scientists in Moscow. The original programmer was an 18-year-old student of Computer Informatics at Moscow University. It was developed through the joint efforts of Academy Soft (Moscow), Andromeda Software (London), and Spectrum HoloByte (U.S.A.).

The concept is relatively straightforward. You're presented with an attractive picture overlaid by a tall black window in the center of the screen. This window is a "pit" into which descend six shapes composed of four tiny squares. The six shapes include a bar, a *T*-shape, an *L*-shape, a rectangle, and two zigzags. Your objective is to maneuver these shapes, rotating and aligning them, to create a solid row of multicolored blocks across the bottom of the pit. When such a row is created, it disappears from the screen and you accumulate points. Misaligned pieces, however, stack up until they reach the top of the pit, and then the game is over.

As rows disappear, the rate at which pieces fall increases. At faster speeds, you score more points per row. Being quick at *Tetris* means faster scoring, boosting your point value per row, and keeping the pit clear for room to maneuver.

Tetris is played solely with a joystick. The instructions are short, consisting of only two pages of large print. In just a few minutes, you'll get the idea of how to play. Developing strategy takes a few more sessions. Mastering *Tetris* is another story altogether.

Choose your level of play at the outset from nine available levels. I've found that, in terms of effective scoring, starting at a medium level is actually more advantageous than starting at the lowest. While one shape is falling, the next shape to descend is previewed in a corner of the screen. Seeing this next shape is extremely helpful in planning where to put the piece currently tumbling down the pit.

Musical accompaniment while you play is optional, and the program will automatically rank your score for up to 15 games. Unfortunately, the game will not save scores from session to session.

Is *Tetris* fun? I found it addictive on the order of *Pac Man*. There's a strong pull to try to stay in the game longer, a competitive desire to build up your score. Yet *Tetris* is mentally more challenging than *Pac Man*. You're trying to beat time, but that's not all. Fitting those puzzle pieces together takes as much mental dexterity as physical. The game is both fascinating and unpredictable. I've played over 15 games in a row and have never noticed the shapes falling in a discernible pattern.

There's less tension in *Tetris* than in arcade-style games and less mental exertion than in adventure games. That makes it all the easier to while away a couple hours juggling the little tiles of color.

Is Tetris *fun? Yes, addictive on the order of* Pac Man*—yet mentally more challenging.*

I have only one real criticism of *Tetris:* Why weren't the details of the onscreen presentation done better? This is the second game from Spectrum I've seen that has not used the 64 to its potential. The outside package is misleading. It features four screen shots taken from IBM PCs. (*Tetris* is also available for the IBM PC, Amiga, and Atari ST.) The 64 version has only one background scene—and it isn't of the variety shown on the box. And while the drawing is quite beautiful and well-executed, it uses none of the 64's vibrant colors. Also, the musical background could be more sophisticated. Here again, the 64 is not used to its potential.

Other features listed on the package aren't available on the 64 version. Different starting heights and different statistic and help screens appear in versions for other machines, but it's not clear why they're excluded from the 64 version. It may be due to lack of memory, why couldn't disk space be used to store different screens which could be retrieved at random intervals, perhaps linked to the level of play?

This, of course, is the fine detailing which would simply make a good program more complete and impressive. The game itself is well-designed, challenging, and fun. That, more than anything, is what matters.

That and my next score.

—David and Robin Minnick

Spectrum Holobyte
2061 Challenger Dr.
Suite 325
Alameda, CA 94501
$24.95

Skyfox II: The Cygnus Conflict

Legends and apocryphal stories abound in computer lore. One very popular story is that the Apple II became a success because of *VisiCalc*, the first computer spreadsheet. Maybe, but I've often felt great numbers were sold because of a game called *Skyfox*.

Whatever the truth may be, *Skyfox* was eventually released for other computers, and now Electronic Arts has chosen the 64 for the debut of *Skyfox II*. A product of Dynamix—the wonderful folks who brought you *Arctic Fox*—*Skyfox II* is worthy of the name, owing only a little to its predecessor.

You may remember that the original game took place in the air above a far planet and that your targets in the various missions were aircraft, tanks, or both. Convincing explosions, good sound effects, and the impression of rapid flight were features that made the original a standout. These features have been carried into the new release—in spades.

Your mission now encompasses the preservation of an entire galaxy against the invading Xenomorphs, but all action will occur in the blackness of space. After selecting one of ten missions and the skill level at which you wish to fight, you'll find yourself sitting in the cockpit of a highly advanced—well, for lack of a better name—space plane.

On your windscreen, a digital countdown begins. At 0, a metal door slides open, and you are rocketed into space, powered by nuclear batteries. Your armament includes neutron disruptors (lasers), photon pulse bombs, and antimatter mines.

The control console, reading from left to right, displays the number of photons, a target identifier, number of mines, a scan monitor, shield and damage indicators, and the energy level. Just below this, a long bar indicates the range of radar scanning. It will also alert you as to enemy craft in your neighborhood.

On the windscreen, a circle and an arrow form a Heads Up Display. The

arrow points the direction to the nearest target and changes color depending on the target's range. When using the neutron disruptors, the circle functions as a gunsight and must be centered on the target.

The scan monitor shows your ship and its relative attitude. Enemy craft are white dots, and the nearest space station is a flashing red dot. You'll need to know this when it's time for repairs or reloading of weapons, because there is little future in trying to dock with an enemy ship.

The name of the game is speed . . . .

Once you've docked with a Federation space station, you'll want to use the Repair command to fix damaged systems. A schematic of your space plane appears on the screen with damaged sections indicated by a yellow or red color. Repair is as simple as moving the cursor (now a screwdriver) to the damaged section and pressing the fire button. This process takes time, and attacks are still taking place. You'll want to be ready to go as soon as you can, perhaps with only partial repairs.

As with the original, the name of the game is speed. This time, instead of soft and friendly clouds rushing by, you'll find yourself in a field of meteors. No matter what direction you choose, the meteors are always rushing toward you (perhaps because you're going faster than they are). I think the field must be a couple of million miles across.

At any rate, they must be avoided or blasted out of the way, for too many hits will eventually destroy your shields. Subsequent hits will lead to a fiery death. Personally, I think the meteors are overdone, a case of too much of a good thing. By avoiding them, however, you'll become very aware of the smoothness of screen scrolling as you whip your craft around in what really feels like 3-D space.

When your mission ends, you'll see a graphic depicting your ship as either crashed or returned home to cheering crowds. If you wish, you can see the evaluation of your mission. You are presented with a list of accomplished objectives, enemy craft and bases destroyed, and a final point score for the entire mission. Then it's on to the next mission.

In selecting a mission, you highlight the one you wish to try. You have the option of seeing a description of the mission. Take it, or go back and try another.

You also have the option, at this point, of checking out the specifications of the *Skyfox II*. There is little point to this, since you can't do anything about them, but leafing through the specs does give you three beautiful views of your space plane. They are worth looking at more than once.

The graphics of *Skyfox II* are excellent, the sound good, and the documentation average. Fortunately, there is not a great deal of the latter. Because some missions require navigation, a star map of the Cygnus system is included, but for reasons not made clear, it's printed in dark blue on darker blue. Luckily, the same map can be called up on the Heads Up Display, where it is much easier to read.

It is also worth noting that *Skyfox II* requires so much memory that it will probably not run until you've disconnected your printer, second disk drive, and any other peripherals except your monitor.

Summing up, I think the original *Skyfox* is difficult to beat, but *Skyfox II* certainly matches it in speed and slam-bang action.

—Ervin Bobo

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94406
$29.95

THEY TALK THE TALK..

By now you've probably seen all the ads for all the different "Super Cartridges" on the market. And they can talk all day, but let's get real: no cartridge is going to back up 100% of anything, no cartridge is going to turn your C-64 into an Amiga, and no fancy screens or hyperbolic claims are going to give a cartridge any more power than it really has.

That's why SUPER SNAPSHOT is still the best multi-function cartridge on the market. It is a product that is the result of a long process of refinement. Our policy of constant upgrading ensures you that you'll always own a state of the art device. SUPER SNAPSHOT will never be "finalized"—because it's built to evolve.

WE WALK THE WALK

HERE'S WHAT SUPER SNAPSHOT V3 CAN DO FOR YOU!

- Copies 99% of all memory resident software.
- Disable feature for true transparency.
- Extremely compatible Turbo Dos fast loader—1541/71/81.
- Rom based scrolling M/L monitor will NOT corrupt memory.
- Turbo 25—Formats for up to 25 times faster loads.
- Fast data copier, single or dual: 1541/71 and 1581/81.
- Sector editor allows fast examination and modification.
- Free KRACKER JAX parameters for those tough cracks.
- Ten-day money back satisfaction guarantee.
- Files run without the cartridge in place.
- Pre-programmed or user definable function keys.
- Dos wedge supports multiple drives—8, 9, 10, 11.
- High Res and multicolor screen dumps to printer or disk file.
- Fast File copier, single or dual: 1541/71/81.
- Sprite killer and exclusive extended life feature.
- Fast load and save routines are used throughout.
- Super Snapshot V1 and V2 owners may upgrade for $20.00. Call us.
- Our great Slideshow Creator available for only $14.95.
- Attention C-128 owners. An optional switch is available which allows you to disable the C-64 mode without removing the cartridge. Only $5.00 additional.

So while other companies spend their time making their packages better, we'll just keep on making our products better. Because we know the difference between TALKING THE TALK—AND WALKING THE WALK. SUPER SNAPSHOT V3: ONLY $59.95!

SOFTWARE SUPPORT INTERNATIONAL

ORDERING is simple: we accept money orders, certified checks, personal checks on prior approval, VISA, MC, Discover and COD. Please add $3.00 shipping and handling per order. $2.00 additional for COD orders. Orders outside of North America please add $7.50 per cartridge for shipping. Defective items will be replaced at no charge. In-stock orders are processed within 24 hrs. Returns are not accepted without authorization #. Washington Residents please add 7.3% sales tax.

Mail your order to: Software Support Int.-D13
2700 NE Andresen Road / Vancouver, WA 98661

Or call our toll-free order line at 1-800-356-1179, 9am-5pm Pacific time, Monday-Friday. After hours orders accepted at (206) 695-9648 7 days a week. Technical support available. Call (206) 695-9648, 9am-5pm Pacific time, Monday-Friday.

VISA MasterCard DISCOVER

In Canada order from: Marshview Software, PO Box 1212, Sackville NB E0A-3C0 only $69.95 CDN.

DEALERS — WE HAVE THE SUPPORT YOU'RE LOOKING FOR!

Do You Believe in Magic?

We Do.

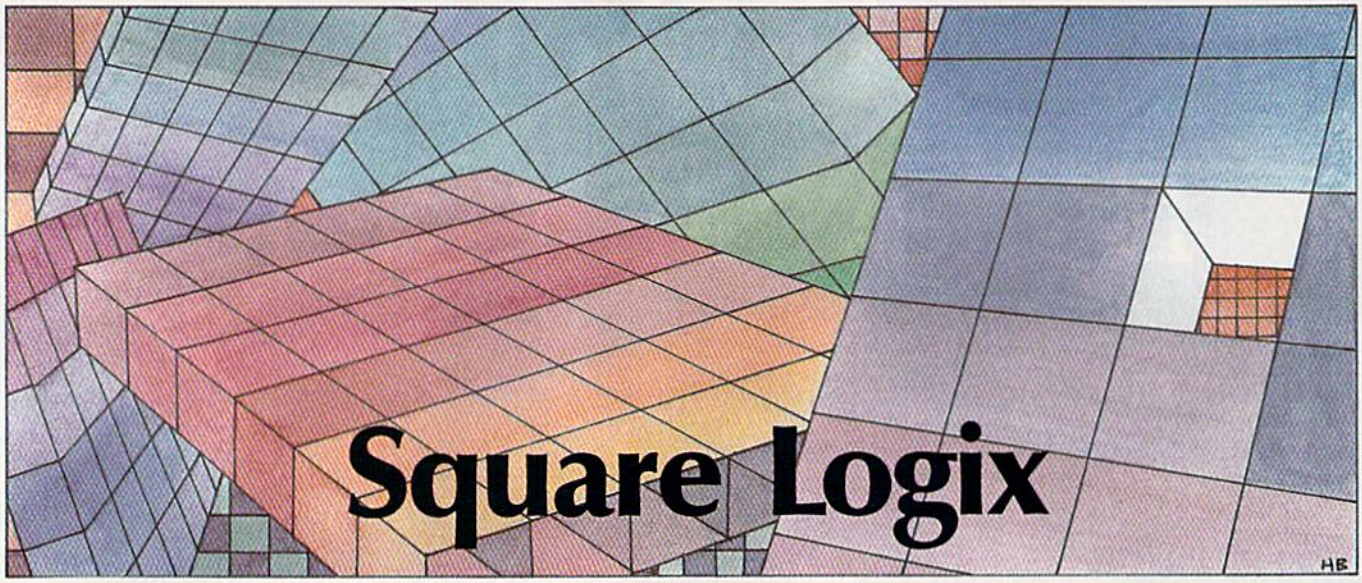
Plug in the Excelerator Plus compatible drive to your Commodore 64 or 64C and you'll believe too. That's because an advanced technology breakthrough has enabled us to create a drive that's quieter, smaller, faster, and more reliable than the 1541 and 1541C. 100% compatible. Dependable. Guaranteed. It's Magic. It's the Excelerator Plus compatible disk drive.

distributed by

M.C.S. 800-433-7756	Computer Direct 312-382-5050
S.C.I. 800-548-9669	Tennex 800-348-2778
Montgomery Grant 800-345-7059	E.C.I. 800-356-5178

Manufactured by **Oceanic America** P.O. Box 70587, Eugene, OR 97401 503-741-1222 / Fax 503-741-1535

Commodore is a registered trademark of Commodore Electronics LTD



Leonard Morris

Puzzle lovers of all ages will find this Commodore 128 game both challenging and entertaining. There are four game variations and nine skill levels so every member of the family can enjoy playing. A joystick is required.

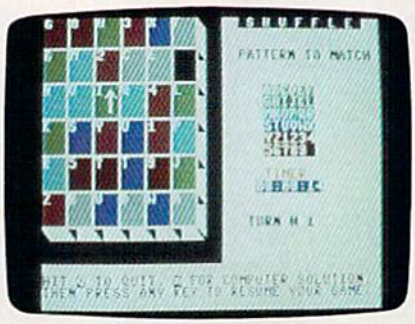
"Square Logix," is a quartet of logic games that will exercise your problem-solving ability and amuse you. Each of the four games offers its own special logic test and, since each one has nine difficulty levels, players from the beginner to the advanced puzzler can share in the fun. You may start playing Square Logix just for the challenge, but Square Logix quickly can become addicting.

Each of the games in Square Logix involves shifting blocks in a 6 × 6 grid until they form a specified predetermined pattern. The number of blocks you'll need to move to solve a puzzle is three times the level number selected. At level 1, for example, three blocks need to be moved; at level 2, six blocks; and so on. It's a good idea to start at level 1 to get a feel for each of the four games and then advance to the more difficult levels.

Getting Started

Square Logix consists of three programs: Two are written in machine language and one in BASIC. To enter Program 1 (SQRS.OP), you'll need to use "128 MLX," the machine language entry program found elsewhere in this issue. When you run 128 MLX, you'll be asked for the starting and ending addresses of the data you'll be entering. Here are the values to use for SQRS.OP:

Starting address: 0B00
Ending address: 0BE7



"Square Logix," a four-in-one game, offers a challenge for every member of the family.

Follow the 128 MLX instructions carefully and be sure to save a copy of the data with the filename SQRS .OP before you leave 128 MLX.

Program 2 (SQRS.SPR), is also written in machine language, so you'll need to enter it with 128 MLX, too. Again, when you run 128 MLX, you'll be asked for the starting and ending addresses of the data you'll be entering. Here are the values to use for SQRS.SPR:

Starting address: 0E00
Ending address: 0F7F

As with Program 1, follow the 128 MLX instructions carefully and be sure to save a copy of the data with the filename SQRS.SPR before leaving 128 MLX.

Since Program 3 (SQUARE) is written entirely in BASIC, simply type it in and save a copy on the same disk as SQRS.OP and SQRS .SPR. Now, make sure your 128 is set up for 40 columns and your joystick is plugged into port 1. Type RUN to get started.

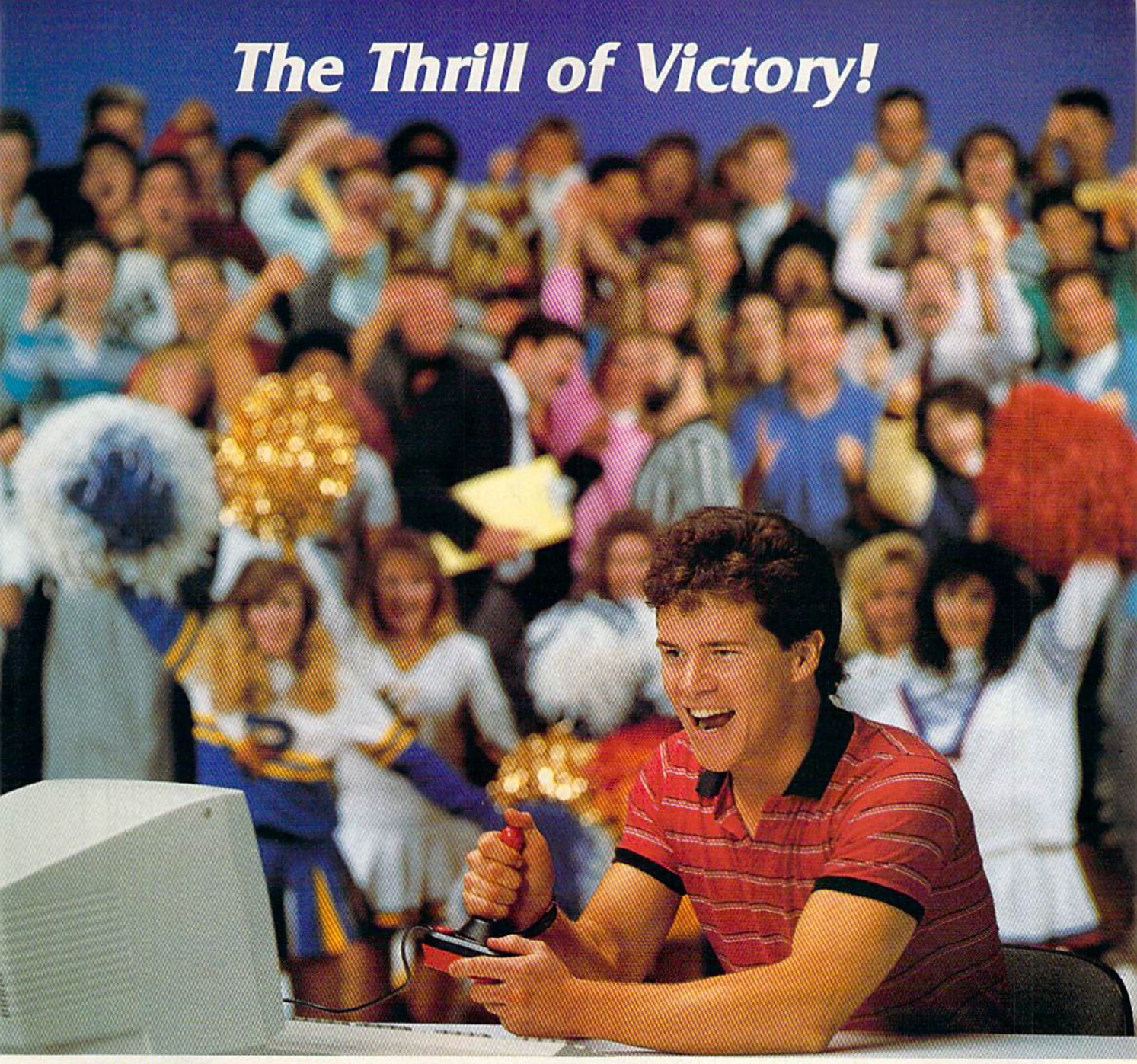
Four Games

When you first run Square Logix, you'll see the main screen with the four game variations displayed. After choosing which of the games you want to play, you'll be given the chance to select a difficulty level of 1–9.

After choosing the difficulty level, you'll see the game screen, with the puzzle block in the upper left corner, a timer on the right side of the display, and a running total of the number of turns you've taken just below the timer. From the game screen, you can press Q to quit or * to see a solution to the puzzle (we'll discuss the solution option a little later).

When you successfully complete a game, the difficulty level and the game's number will be displayed at the bottom of the screen, and a colorful display will highlight the entire display. You'll then be prompted to press the fire button to start another game.

The Thrill of Victory!



NEW! *Through Exclusive Arrangement with Bally™*

You look up at the clock...eight seconds to play...the score's tied. You streak towards the goal, weaving and bobbing. You fake inside...the goalie lunges...slapshot...score...the crowd goes wild!

You're in a bunker just off the green. You need par to keep it even. You swing...the ball floats out in a puff of sand. It rolls gently breaking towards the hole...then drops. You've won!

HAT TRICK™ and **MINI-GOLF™** by CAPCOM put the thrill and excitement of competitive sports in your Commodore. Vibrant graphics make these games so real that you can feel the pressure of intense athletic competition. The outcome of these CAPCOM Sports Series challenges depends upon your quick reflexes and brilliant strategy.

CAPCOM's **HAT TRICK™** and **MINI-GOLF™**—games so real you can hear the roar of the crowd!

CAPCOM™

CAPCOM U.S.A., Inc.
1283-C Mountain View/Alviso Road
Sunnyvale, CA 94089
408-745-7081

Commodore is a registered trademark of Commodore Electronics Ltd., Hat-Trick and Mini-Golf are under license from Bally Sente, Inc.

Let's take a look at each of Square Logix's four games.

Game 1: Shifts. This is the easiest of the four games and the best one with which to start. As the name suggests, you use the joystick to shift columns and rows of blocks until you produce the winning pattern. An arrow inside the array indicates the direction in which the row or column will be shifted. Any block that's shifted off the array will wrap around to its opposite end.

To shift blocks, press the fire button. The arrow can be moved horizontally or vertically by moving the joystick in the corresponding direction. Don't forget that the whole row or column moves, not just one block.

Game 2: Shuffle. This is played in much the same way as Shifts, except that the pattern you must match has a definite order, identified by letters and numbers on the blocks. This makes Shuffle somewhat more difficult than Shifts.

Game 3: Rotate 1. This game is more challenging. You must generate the desired pattern by rotating a group of four blocks—indicated on the screen by a large outlined square—either clockwise or counterclockwise. The direction of rotation is controlled by holding the fire button down and moving the joystick right for clockwise or left for counterclockwise.

To move the outlined group either horizontally or vertically, move the joystick in that direction. It may take several games of play to unlock the secret of Rotate 1, but when you do, you'll be ready for Rotate 2.

Game 4: Rotate 2. This is the the most difficult game of the four. This variation uses the same logic as Rotate 1, but a group of nine blocks, instead of four, is rotated.

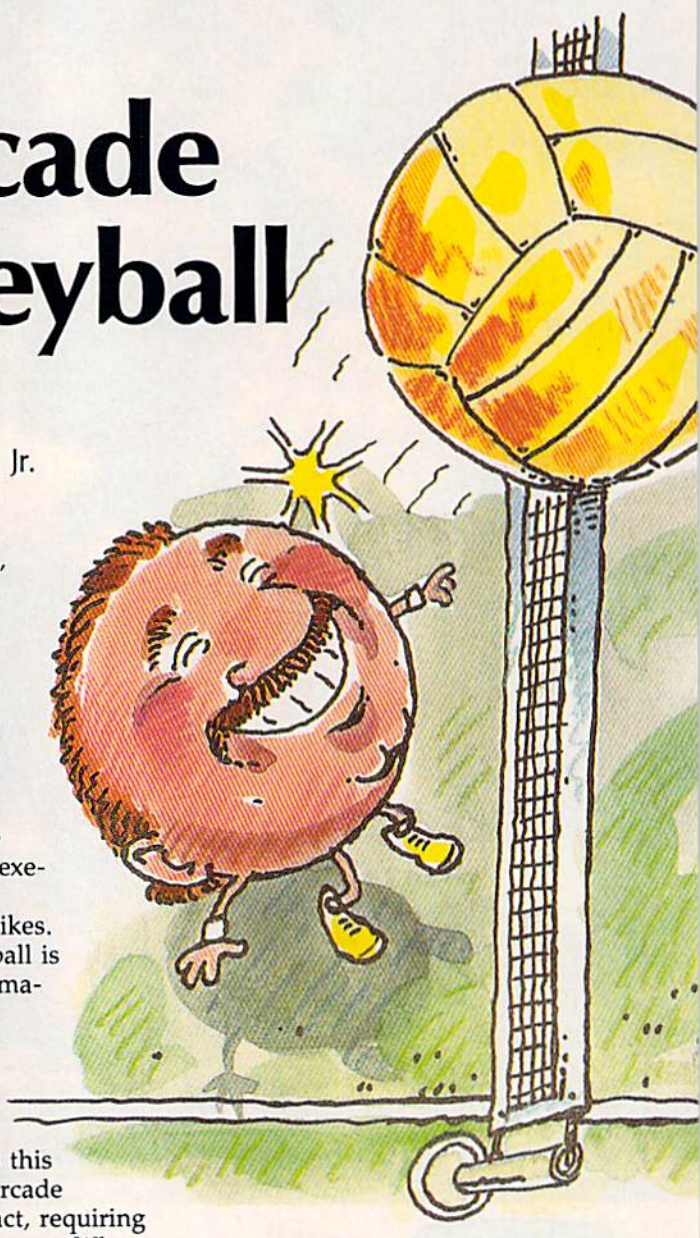
The Solution

If you decide you need a little help to solve the game you're playing, you'll need to use the asterisk (*) key. Pressing this allows you to see the solution to the game. The computer displays only the solution, however; it doesn't actually solve the game for you. After the computer shows you the solution, you can continue your game by pressing any key.

See program listings on page 69.

Arcade Volleyball

Rhett Anderson
& David Hensley, Jr.



"Arcade Volleyball" is a two-player arcade-style game with colorful graphics and realistic sound effects. You control two high-jumping, if short, expert volleyball players. It won't be long before you're executing top-notched serves, sets, and spikes.

Arcade Volleyball is written entirely in machine language, so you'll need to use "MLX," the machine language entry program found elsewhere in this issue, to enter it. Arcade Volleyball is compact, requiring less than 4K of memory. When MLX asks for a starting address and ending address, respond with the values indicated:

Starting address: 0801
Ending address: 1688

Be sure to save a copy to disk or tape after you've finished typing.

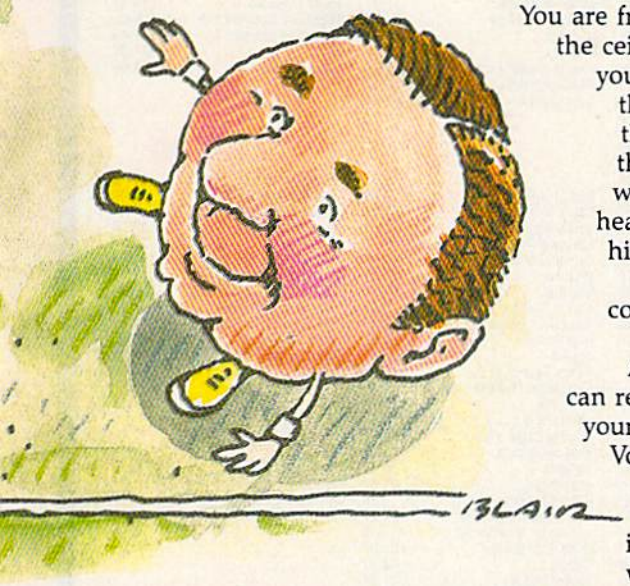
The Big Serve

When you're ready to play, plug in two joysticks. Although Arcade Volleyball is a machine language program, it can be loaded, saved, and run just like a BASIC program. To start the game, load the program and type RUN.

In the center of the court, you'll see the volleyball net. One player controls the side to the left of the net; the other player controls the side to the right. Above the court, you'll see the status line. Here you'll find a two-digit score for each player. The player with joystick 1 controls the yellow and green jumping heads on the left side of the screen; the player with joystick 2 controls the purple and red heads on the right.

For the first point, it's a redhead's serve. Position him under the floating volleyball and press the fire button to serve. You have three chances to get the ball over the net. If you fail, you'll lose the serve.

How do you play volleyball without hands? Use your head, of course. You and an opponent each control two mutant heads in this fast-paced and rather unusual version of America's favorite beach sport. An optional practice mode is included. For the Commodore 64. Joystick(s) required.



The joystick controls are easy to learn. You can run either left or right by moving the joystick in the appropriate direction. To jump, press the fire button. The players in Arcade Volleyball are gifted; they can move left and right while in the air. You control both of your players at the same time—there's no need to switch back and forth. In time, you'll grow accustomed to the synchronized movement.

Use Your Head

You can hit the ball while you're on the ground or in the air. If you hit the ball while you're standing on the ground, the ball will neither lose nor gain speed. If you jump to hit the ball, the ball will speed up. You are free to bounce the ball off the ceiling and the wall behind you. If you hit the ball with the left side of your head, the ball will tend to go to the left. If you hit the ball with the right side of your head, it will go right. If you hit the ball with the top of your head, the ball will continue on with the same horizontal velocity.

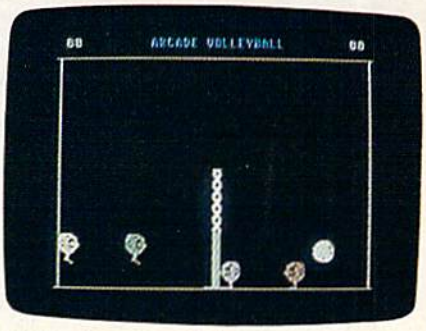
As in real volleyball, you can receive points only during your serve. However, Arcade Volleyball differs from real volleyball in several ways. First, the court is entirely surrounded by walls; there is no need to worry about hitting the ball out of bounds. Also, the same head can legally hit the ball several times in a row, as long as the three-hit-per-team limit is not exceeded. Remember, the serve does not need to travel over the net on the first hit. Finally, the first player with 15 points wins the game—there is no need to win by 2 points as in real volleyball. When a player reaches 15 points, the game pauses. Press a key to start another game.

Over, Into, and Under the Net

When you play Arcade Volleyball, your prime concern is to get the ball over the net. If the ball hits the top of the net, it may either continue over the net or bounce back to your side. Either way, the ball's velocity decreases. If the ball goes over the net, hits the opponent's wall, and bounces back to your side, you'll have three more chances to get the ball over the net.

If the ball hits the side of the net, it rebounds at full velocity. Don't lose your composure, though. You may still have a chance to score.

If the ball hits the floor on your side of the court, you'll lose your serve—or a point, if your opponent was serving. You must also be sure to keep the ball from going under the net. This is considered to be the same as hitting the floor.



It's heads up in this fast-moving volleyball game for one or two players.

Warm-Up

If you'd like to warm up with a computer opponent, you can make a special one-player version of Arcade Volleyball. To do so, follow these steps:

- Load the program
- Type **POKE 2065,1**
- Save the program with a new name
- Type **RUN**

You won't find the computer opponent especially challenging, but the one-player mode is a good way to learn how to serve and return the ball.

Playing Tips

The key to the game is learning the angles. Watch the ball carefully as you play. If you jump to hit the ball, it will speed up and the angles will change. The players' horizontal movement is limited—try to anticipate which head the ball will come to. Be sure to use the walls and nets to your advantage. Careful use of these obstacles is the best way to confuse your opponent.

See program listing on page 75.

LET'S FACE IT—MAIL ORDER HOUSES ARE *NOT* ALL THE SAME!

SOFTWARE SUPPORT INTERNATIONAL

CONVENIENCE—FAST SERVICE—RELIABILITY—SUPPORT

Hands On Software, Inc. is now distributing its own products. "What does that mean to me," you say! Well, for one thing, we have expanded our product line to include games and utilities from other publishers, accessories, Commodore authorized service, and even a selection of pre-owned titles. The technical staff here is second to none, and is well-known to thousands of Commodore users. We are committed to your satisfaction—and are prepared to prove it!

ACCESSORIES

1541/71 Serial or Power Cable	4.95	10 Cnt. Disk Storage	1.95
C-64 Color Monitor Cord	4.95	50 Cnt. Disk Storage	8.95
C-64 Repairable Power Supply	39.95	100 Cnt. Disk Storage w/Lock	12.95
RS-232 Interface	36.95	3.5" Disk Labels—25 Cnt.	1.00
MW 350 Printer Interface	49.95	5.25" Disk Labels—96 Cnt.	1.00
Aprospand 64	27.95	3.5" DS/DD Diskettes	1.29
Aprospand Extender Cable	15.95	5.25" DS/DD Diskettes—Black	.49
12" Printer Stand/Wire	8.95	5.25" DS/DD Diskettes—12 Colors	.79
Commodore 1351 Mouse	37.95	Write Protects—100 Cnt. Black	1.00
Mouse Mat	8.95	Tyvek Sleeves—High Quality	each .09
41/71/64/128 Dust Cover	each 8.95	Slik Stik—Joystick	6.95
Disk Notcher—Square Cut	4.95	Quick Shot II—Joystick	7.95
5.25" Disk Drive Cleaner	5.95	Tac 2—Joystick	10.95
3.5" Disk Drive Cleaner	6.95	Tac 3—Joystick	11.95

Commodore Authorized Service by Russell & Associates

Repairs: Commodore		Service:	
C-64 Keyboard	54.95	C-128 Rom Upgrade	42.50
C-128 Keyboard	79.95	1571 Rom Upgrade	19.95
1541 Align	39.95	C-128 64K Ram Video (great for Basic 8)	19.95
1541 Repair (w/align)	65.00	**Repairs: Amiga**	
1571 Align	39.95	Amiga 500	135.00
1571 Repair (w/align)	89.95	Amiga 1000	135.00
1702 Monitors	75.00	Amiga 2000	135.00
1902 Monitors	85.00	A1010 Align	54.95
Commodore Printers	85.00	A1010 Repair	145.00

All C-64's & C-128's **must** have Power Supply included. Thirty-day warranty on all repairs. Buy a Power Supply from Software Support International and get a 60-day warranty. Please include a detailed description of your problem and try to isolate if possible.

Russell and Associates reserves the right to refuse any repair. Repair jobs will be charged $3.00 per piece for return shipping/handling.

Abacus Software

Basic Compiler 64	24.97
Basic Compiler 128	36.97
Cad Pak 64	24.97
Cad Pak 128	36.97
Chart Pak 64	24.97
Chart Pak 128	24.97
Geos Inside & Out Book	12.97
Geos Disk	9.97

ACCESS Software Incorporated

Echelon	24.97
LB & Tourn. & Exec. 1	12.97
Mach 128	30.97
Tenth Frame	24.97
World Class Leader Board	24.97
W/C L/B Fam/Cour 1 or 2	12.97

ACCOLADE

Ace of Aces	18.97
Apollo 18	18.97
Bubble	18.97
Card Sharks	18.97
Fourth & Inches	18.97
Hardball	18.97
Killed Until Dead	18.97
Miniputt	18.97
Plasmatron	9.97
Power at Sea	18.97
Project Space Station	9.97
Test Drive	18.97
The Train	18.97

ACTIONSOFT

Thunder Chopper	18.97
Up Periscope	18.97

ACTIVISION ENTERTAINMENT SOFTWARE

Aliens	21.97
Gee Bee Air Rally	18.97
Labyrinth	18.97
Last Ninja	21.97
Maniac Mansion	21.97
Might & Magic	24.97
Portal	24.97
Shanghai	18.97

Softworks

Desk Pak I	10.98
Font Pak I	10.98
Geos 64	36.97
Geos 128	42.97
Geocalc 64	30.97
Geocalc 128	42.97
Geodex 64	10.98
Geodex 128	42.97

Softworks

Geofile 64	30.97
Geofile 128	42.97
Geoprint Cable	24.97
Geoprogrammer 64	42.97
Geoprogrammer 128	Call
Geopublish 64	42.97
Geopublish 128	Call
Geospell	18.97
Geowriter's Workshop 64	30.97
Geowriter's Workshop 128	42.97

Broderbund Software

Carmen Sandiego USA	24.97
Carmen Sandiego World	21.97
Cauldron 1 & 2	18.97
Magnetron	17.16
Print Shop	27.97
Print Shop Companion	21.97
P/S Graphics 1 or 2 or 3	17.67
P/S Holiday Graphics	15.97
Superbike Challenge	13.92

CAPCOM

Ghosts & Goblins	18.97
Side Arms	18.97
1942	18.97

MINDSCAPE INC.

Breakthru	20.40
Commando	13.92
Kid Niki	20.40
Speed Buggy	18.46

DATA SOFT

Alternate Reality: City	18.97
Alternate Reality: Dungeon	28.81
Road Wars	Call
Tobruk	Call
Video Title Companion 1 or 2	12.97
Video Title Shop	18.97

DATA SOFT

Dictionary Disk	9.97
Digital Superpak 2	60.97
Pocket Filer 2	36.97
Pocket Planner 2	36.97
Pocket Writer 2	36.97

ELECTRONIC ARTS

Alien Fires	Call
Amnesia	27.36
Bard's Tale 1 or 2	27.36
Battle Droids	Call
Chessmaster 2000	24.97
Chuck Yeager's AFS	24.06
Death Lord	Call
Delta Patrol	14.16
Demon Stalker	18.97

ELECTRONIC ARTS

Dragon's Lair	17.46
Earth Orbit Station	22.06
Hunt For Red October	22.78
Instant Music	20.76
Legacy of the Ancients	20.76
Marble Madness	20.76
Master Ninja	Call
Mavis Beacon Typing	Call
Monopoly	27.40
Outrageous Pages	33.96
Paper Clip 3	33.96
Paperclip Publisher	Call
Pegasus	22.06
Pegasus Scenerio 1	Call
Rockford	20.80
Sanxion	14.16
Scrupples	24.10
Skate or Die	20.76
Skyfox II	20.76
Strike Fleet	18.97
Twilights Ransom	Call
World Tour Golf	20.76

EPYX

California Games	24.97
Champ. Wrestling	24.97
Create A Calendar	18.97
Death Sword	Call
Destroyer	24.97
Four X Four Racing	Call
The Games: Winter Edition	Call
Graphics Scrap 1 or 2 or 3	15.97
Home Video Producer	Call
Impossible Mission II	Call
L.A. Crackdown	Call
Omnicron Conspiracy	24.97
Sporting News Baseball	Call
Spy vs. Spy 3	15.97
Street Sports: Baseball	24.97
Street Sports: Basketball	24.97
Street Sports: Soccer	Call
Sub Battle Simulator	24.97
Summer Games II	13.92
Winter Games	13.92
World Games	24.97

FIREBIRD

Guild of Thieves	24.97
Knight Orc	15.97
Revs +	15.97
Star Glider	24.97
Talking Teacher	21.97
The Pawn	24.97
The Sentry	24.97
Tracker	24.97

GAMESTAR

Champ. Baseball	18.97
Champ. Basketball	21.97
GFL Football	21.97
Two on Two Basketball	18.97

MICRO PROSE

Airborne Ranger	21.97
F-15 Strike Eagle	21.97
Gunship	21.97
Pirates	24.97
Project Stealth Fighter	24.97
Red Storm Rising	24.97
Silent Service	21.97

MINDSCAPE INC.

Bad Street Brawler	Call
Bop & Rumble	18.97
Bop & Wrestle	18.97
Crossword Magic	30.97
Defender of the Crown	21.97
Deja Vu	21.97
Gauntlet	21.97
Harrior Combat Simulator	Call
Head Over Heels	12.97
High Roller	18.97
Impact	Call
Indoor Sports	18.97
Indy Jones/Temple of Doom	Call
Infiltrator	18.97
Infiltrator II	21.97
Into the Eagle's Nest	18.97
King of Chicago	Call
Mutants	12.97
Paperboy	21.97
Road Runner	Call
SuperStar Ice Hockey	21.97
SuperStar Misl Soccer	Call
SuperStar Soccer	21.97
Taipan	12.97
Three Stooges	21.97
Warp Speed 64/128 40/80	30.97
Winter Challenge	12.97
Wizball	12.97
Xevious	18.97

ORIGIN

Autoduel	33.36
Moebius	26.88
Ogre	20.40
Ultima I	26.88
Ultima 3	26.88
Ultima 4	39.84
Ultima 5	Call

Professional Software Inc.

Fleet Filer 64/128	24.97
Fleet System II +	36.97
Fleet System III 128	42.97
Fleet System IV	48.97

SPRINGBOARD

Certificate Maker	26.88
Certificate Maker Libr. I	20.40
Newsroom	33.36
N/R Clipart 1 or 3	20.40
N/R Clipart 2	26.88
P/S Graphic Expander	23.64

subLOGIC

Flight Simulator II	33.97
Flight Sim Scenery 1-6	14.16 ea.
Flight Sim Scenery 7	17.46
Jet	27.36
Stealth Mission	33.96

TIMEWORKS

Data Manager 2	17.16
Data Manager 128	33.36
Desktop Publisher	Call
General Ledger	33.36
Partner 64	33.36
Partner 128	39.84
Swiftcalc/Sideways 64	17.16
Swiftcalc/Sideways 128	33.36
Sylvia Porter F/P 64	33.36
Sylvia Porter F/P 128	46.32
Word Writer 3	33.36
Word Writer 128	33.36

UNISON WORLD INCORPORATED

Art Gallery 1 or 2	15.97
Art Gallery American Hist.	Call
Art Gallery Fantasy	15.54
Printmaster Plus	21.97

MISCELLANEOUS

Basic 8	29.95
Basic 8 Guide/Beginners	19.95
Bob's Pro Term 64	30.97
Bob's Pro Term 128	42.97
B/W Business Form Shop	24.97
CSM Drive Align Kit	30.12
CSM Protection Manual I	22.55
CSM Protection Manual II	26.15
Dark Castle (3-60)	21.97
Doodle	24.97
Font Master II	30.97
Font Master 128	36.97
Hes Mon 64 (cart)	9.95
Inside Commodore DOS	19.95
JK Lasser Money Manager	46.32
Merlin Assembler 64	30.97
Merlin Assembler 128	42.97
Microlawyer	36.97
Microleague WWF Wrestling	24.95
Personal Newsletter	Call
Strider's Classical Music—All 10 disks in Filer	49.95
Strip Poker	18.97
Poker Data Disks 1 or 2 or 3	12.97
Superbase 64	48.97
Superbase 128	48.97
Superbase the Book	10.57
Super Sunday	23.64
Superscript 64	30.97
Superscript 128	42.97

MANY OTHER TITLES AVAILABLE — CALL FOR PRICES!

Here they are! The products that have made us one of the most respected companies in the mail order business. Our utilities have become a staple in the libraries of thousands upon thousands of Commodore users worldwide. Original ideas and workmanship throughout, (a rarity nowadays!) our products are guaranteed to please. If you enjoy dealing with people who genuinely have your best interest at heart, look no further. Our products are created with you in mind. We offer programs that are protection free and most can be transferred to the 1581 disk drive. Also, we offer the best technical support in the business. Les and Dan are available five days a week to help with problems. If you see a program that interests you on this page, and you need more detailed information to make an educated decision, just write or call for our free catalog. Remember: Our Business is SOFTWARE SUPPORT!

ALL NEW

Renegade

THE CURE FOR RANDOM EXCESS

ALL NEW

Random chance. Buy enough utilities, and every so often you'll get a good one, right? Well, that's one way to do it. One very expensive way. We've got a better idea!

We've had the hottest archival programmers in the industry develop a new series of utilities of startling power. They took the best ideas from the past and re-created them, using state of the art techniques combined with a conceptual grasp of the future of computing.

The results of this special project are now available in a single, devastating package. A next-generation package called RENEGADE.

FEATURES INCLUDE:

- Single or Dual High Speed Data Copier
- Single or Dual State of the Art Nibbler
- Directory Editor: Organize your Disks
- GCR Editor: For the Experienced Hacker
- Geos™ Modual: PARAMETERS and TOOLS
- 200 Parm: Oldies as well as our Latest
- Parameter Updates Released Every Two Months
- Copier Updates Released Every Four Months
- Compatible with C-64/128 with 1541/71 Drives
- Single or Dual Ultra Fast File Copier
- Capable of Archiving RapidLok Protection
- Scrolling M/L Monitor with Drive Mon
- Error Scanner with Unique Sector Editor
- Byte Pattern Scanner: High Speed Searches
- Upgradable Sub Menu: New tools in the works
- New Parameter updates only $9.95 each
- Major RENEGADE upgrades only $9.95 each
- Technical support available: absolutely.

Remember the first programs that came out when the C-64 was still a fairly new machine? Have you seen the newest software lately? You'd think they were running on a different computer. RENEGADE represents the same quantum leap forward in the utilities arena.

So if you're tired of relying on random chance to provide you with good utilities, get RENEGADE—next generation software, available today!

ONLY $34.95

C-128 Helper

Helper is an exciting new type of Software for the C-128 Computer with 80 column monitor.

- Screen Based Databasing
- User Definable
- Editor allows modifications
- Demo included that serves as a Basic 7.0 Electronic reference manual
- Screen dumps to printer
- 1581 version available

ONLY $24.95

Graphic Art Disks

Top quality graphics are hard to find. These will definitely please you.

- 10 Volumes available
- Themes followed in most
- Printmaster™/Printshop™ Side A compatible
- Easily transferred to 1581

ONLY $14.95 per Volume

Elite V3.0

Elite V3 copies the "impossible."

- Copies V2.0 of a popular 64/128 planner, filer (64 only), writer.
- Leaves the Backup protection free.

Why pay for Backups of titles you already own?

ONLY $6.95

Elite V4.0

Our Elite Series is second to none for its copying capabilities.

- Elite 4 created to copy titles protected to the MAX!
- Special MAX Copier included
- Update policy included
- Free Bonus—The Shotgun I

ONLY $14.95

Super Cat

The greatest disk library cataloger ever produced for the Commodore 64.

- Catalogs up to 640 Disks w/5000 titles per catalog
- Twice as many with 2 drives
- Load, save, edit, change any entry
- Prints a variety of reports and even labels
- Lightning fast and easy to use!

ONLY $24.95

Graphic Label Wizard

This is the ultimate label utility.

- Databasing with graphics included
- Supports Commodore as well as Epson compatible printers
- Printmaster™ Printshop™ Software Solutions™ compatible
- 1581 transferable
- Satisfaction guaranteed!

ONLY $24.95

C-128 Cannon

The total copy/utilities package created just for C128 owners.

- Nibblers—Single or Dual
- Fast Copiers—Single or Dual
- File Copiers—Single or Dual
- Scanners—Error and Density
- 1581 Utilities
- Directory editing
- 100 Free Kracker Jax Parms
- 1541/71/81 Drives Supported—Single or Dual

ONLY $34.95

Kracker Jax Revealed I & II

Our knowledge of protection schemes has made us famous. Now find out how we do what we do best. Our books are your key to REAL knowledge. OTHERS ONLY GIVE SURFACE INFO—we dig deep—much deeper. We can show you exactly how today's copy protection prevents you from backing up your software.

Revealed Book I with Reset Button
$23.50

Revealed II with Hesmon Cartridge
$23.50

Kracker Jax

THE REVOLUTIONARY ARCHIVAL SYSTEM!

Kracker Jax is the powerful parameter-based copying system that has taken the country by storm! What IS a parameter? It's a custom program that allows your 1541 or 1571 disk drive to strip ALL copy protection from your expensive software, leaving you with UNPROTECTED, TOTALLY BROKEN BACKUPS that can even be copied with a simple fast copier!

We declare **Kracker Jax** to be the best system of its kind on the market today! A bold claim? Maybe.

But don't take our word for it—if you want the REAL story on how good **Kracker Jax** is, just ask one of our customers. Don't worry. You won't have any problem finding one.

Vols 1-2-3-4 **Only $9.95 ea.**
Vols 5-6-7 **Still Only $19.95 ea.**

Hacker's Utility Kit

State of the art tools for the computerist ready to take control of his software library!

- Whole disk scanners
- GCR Editor
- Fast Data/Nibble copiers
- File tracer
- Byte Pattern Finder

Much, Much More—$19.95

Sysres™ Enhanced

The best—and we mean Best Basic enhancement system for the C-64.

- Adds over 25 major commands to Basic
- Extended Super DOS-Wedge
- Scrolling through Basic
- Renumber, Trace, Search, and many other features too numerous to mention
- 1541/71 fast loader included
- M/L monitor from Basic
- Transferable to 1581 Disk

ONLY $39.95
The best money you'll ever spend on your Commodore!

SOFTWARE SUPPORT INTERNATIONAL

ORDERING is simple: we accept money orders, certified checks, personal checks only on prior approval, VISA, MC, Discover and COD. Please add $3.00 shipping and handling per order. $2.00 additional for COD orders. Orders outside of North America please call for shipping charges. Defective items will be replaced at no charge. In stock orders are processed within 24 hrs. Returns are not accepted without authorization #. Washington Residents please add 7.3% sales tax. Software orders over $100.00 will be shipped UPS 2nd Day Air at no additional charge. U.S. orders only. All prices subject to change.

Program Submissions Invited
Need more info? Call or write for our free catalog.

Mail your order to: Software Support Int.-D13
2700 NE Andresen Road / Vancouver, WA 98661

Or call our toll-free order line at 1-800-356-1179, 9am-5pm Pacific time Monday-Friday.
After hours orders accepted at (206) 695-9648 7 days a week.
Technical support available. Call (206) 695-9648, 9am-5pm Pacific time, Monday-Friday.

VISA MasterCard DISCOVER

DEALERS — WE HAVE THE SUPPORT YOU'RE LOOKING FOR!

UTILITIES UNLIMITED, Inc.

12305 N.E. 152nd Street
Brush Prairie, Washington 98606

Orders taken 24 hrs. a day; seven days a week.

If you wish to place your order by phone, please call **206-254-6530**. Add $3.00 shipping & handling; $2.00 for COD on all orders. Visa, M/C accepted. Dealer Inquiries Invited.

WORLD'S BIGGEST PROVIDER OF C64/128 UTILITIES

Software Submissions Invited

We are looking for HACKER STUFF: print utilities, parameters, telecommunications, and the unusual.

We now have over 1,000 parameters in stock!

SUPER PARAMETERS 500 PAK

At a time when many programmers are cutting back on writing parameters, we are going full steam! After getting several requests for parameters on many of the "oldies but goodies" **WE DID JUST THAT! ANOTHER 1st: 500 MORE SUPER PARAMETERS** in one pack. This **FANTASTIC 5-DISK SET** is a value of over $100 for less than 1/2. **$39.95**

SUPER PARAMETERS 100 PAKS: 1 thru 5

. . . **YOU GET 100 OF THE BEST PARAMETERS, ANYWHERE.** Professionally done, easy to use, reliable, fast and full of performance. This package can remove all protection. Includes titles from all major software publishers for the C64/128. **$14.95@**

ALL PARAMETERS ARE TOP QUALITY—NO FILLER OR JUNK

The 'Original' Parameter Cross-Reference

Ever ask, "Is there a parameter for this program? And where do I get it?" **ASK NO MORE!** The answers are all in this book. Over 5,000 listings. **$19.95@**

If anything can copy everything, this may be it!

Introducing SUPERCARD

Well folks, here it finally is. THE BEST! There is just not anything better than **Supercard.** Even our competitor has stated that to back up the newest protection schemes, a high powered software/hardware package is needed. **Supercard** is the product of 2 years and $300,000 in total investment. **Supercard** is installed easily into your 1541 or 1541c. in just minutes with no soldering required. This package makes backups of programs that no other utility can touch. With the **Supercard** installed in your 1541 these programs are no threat. This small card (approximately 2" square) plugs in fast and easy with only a screwdriver—and it is software upgradable to cover new schemes. (Call for 1571 version information and price.)

SUPERCARD has done 100% of everything we tested.

$44.95 C. Games or S. Figher or A. Ranger? For dual drives add $35.00

Guarantee: If you're not satisfied with **Supercard** for any reason, you may return it in working and saleable condition within 10 days for a full refund, minus shipping and handling charges.

THE FINAL CARTRIDGE III versus super snap shot

The Cartridge war heat up. Well folks, here's the real story!!! In their latest ad, our competition claims they are getting better reviews. Well, that's partly true . . . but mostly false. First of all, they are comparing reviews written about the old Final Cartridge and not the current version III. We at Utilities Unlimited Inc. are so sure that you would choose The Final Cartridge over that other one we make the following offers:

1. 100% no-questions-asked 10-day refund Guarantee.

2. For those of you who bought the super snap shot believing that you were buying the best, then saw the Final Cartridge III, **we offer you $30.00 for your super snap shot, as a trade in for the BEST . . . The Final Cartridge III.**

Every Final Cartridge III now includes many features not found in super snap shot, as well as our newest 64/128 nibbler and 100 Super Parameters. **(NOW W/CLOCK)** Still only **$54.95**

SIMILAR PRODUCTS MAY APPEAR ELSEWHERE LATER; JUST REMEMBER YOU SAW THEM HERE FIRST!!

PARAMETERS CONSTRUCTION SET

The company that has **THE MOST PARAMETERS** is about to do something **UNBELIEVABLE.** We are giving you more of our secrets. Using this **UNIQUE** program, it will take your data and automatically **WRITE PARAMETERS FOR YOU:** it will also **CUSTOMIZE** the disk with your name. It will impress you as well as your friends. The **"PARAMETER CONSTRUCTION SET"** is like nothing you've ever seen. In fact you can even **READ PARAMETERS** that you may have already written; then by using your construction set rewrite it with your new **CUSTOMIZED MENU.**

$34.95

(Another first!) THE 128 SUPERCHIP—A, B or C

A There is an empty socket inside your 128 just waiting for our **SUPER CHIP** to give you 32k worth of great **BUILT-IN UTILITIES**, all at just the **TOUCH OF A FINGER.** You get built-in features: **FILE COPIER, NIBBLER, TRACK & SECTOR EDITOR, SCREEN DUMP,** and even a 300/1200 baud **TERMINAL PROGRAM** that's 1650, 1670 and Hayes compatible. Best of all, it doesn't use up any memory. To use, simply touch a function key, and it responds to your command.

B Has super 81 utilities—a complete utility package for the 1581. Copy whole disks from 1541 or 1571 format to 1581. Many options include 1581 disk editor, drive monitor, Ram writer and will also perform many CP/M & MS-DOS utility functions.

C "C" is for combo and that's what you get. A super combination of both chips A and B in one chip, switchable at a great savings to you. **ALL CHIPS INCLUDE 100 PARAMETERS FREE!**

Chips A or B: **$29.95@** Chip C: **$44.95@**

V-MAX, RAPID LOCK DIGITAL SOLUTIONS™

HES MON cartridges (limited supply)	$ 4.95
1541 Mash (for drive alignment)	$14.95
64 BBS: for 1 or 2 drives	$19.95
64 MODEM prg.: w/wargames auto dialer	$14.95
N-CODER & D-CODER: together for only	$14.95
GRAPHIC LABEL MAKER: the original	$12.95
D-COMPILER: for the famous BLITZ!	$14.95
HEAVY DUTY REPAIRABLE 64 POWER SUPPLIES . . Too many 64 repairs are due to faulty old supplies—don't wait!	$39.95
DISK NOTCHERS: double disk capacity	$ 4.95
SECURITY KEYS: lost your dongle? (Golf & bowling)	$ 3.95
Used super snap shot (limited supply)	$29.95
The Original Geos Standardizer	$ 9.95
SUPER NIBBLER: 64/128	$14.95
SUPER CARTRIDGE	$44.95

LOCK PICK—THE BOOKS—for the C64 and C128

Lock Pik 64/128 was put together by our crack team, as a tool for those who have a desire to see the **INTERNAL WORKINGS** of a parameter. The books give you **STEP-BY-STEP INSTRUCTIONS** on breaking protection for backup of 100 popular program titles. Uses **HESMON** and **SUPEREDIT.** Instructions are so clear and precise that anyone can use it. ★**OUR BOOK TWO IS NOW AVAILABLE**★

BOOK 1: Includes Hesmon and a disk with many utilities such as: **KERNAL SAVE, I/O SAVE, DISK LOG FILE** and lots more, all with instructions on disk. A long-time favorite.

BOOK 2: 100 NEW EXAMPLES, Hesmon on disk and cartridge plus more utilities to include: **A GENERAL OVERVIEW ON HOW TO MAKE PARAMETERS** and a **DISK SCANNER.**

$29.95 each OR BUY BOTH FOR ONLY **$49.95**

Now with FREE Hesmon Cartridge.

For product support, call between 10 a.m. to 4 p.m. Pacific Time.

8K Memory Is Enough!

Fred D'Ignazio
Contributing Editor

A reader wrote me recently to confess that he once remarked "8K of RAM was all the memory anyone would ever need."

Don't laugh! Many of us old-timers are guilty of making the same statement.

I remember when I was getting my first computer . . . I told the dealer that I needed 64K of memory because I was a writer and would be writing long chapters for books. The dealer finally gave me what I wanted, but he warned me that I was being extravagant. "You know, 16K would work just fine for your documents now,—and 32K would last you forever."

Attack of the Terabytes

Last week a friend of mine, Dr. Gerri Sinclair, sent me some E-mail. "I am so frustrated," she wrote. "Now that computers are starting to plug into CD-ROM 'libraries' and are processing digital sounds, photographs, and full-motion video, a million bytes of memory just doesn't cut the mustard!"

I wrote back to Gerri asking what she thought *would* cut the mustard. Her reply: "Sixteen million bytes, minimum, for main storage, and another 80–160 megabytes on hard disk. And this is just the start. Soon we'll need gigabytes and terabytes, and even that might not be enough."

Terabytes? It sounds like an invasion of Japanese snapping turtles.

Have Mercy!

Computers make us lazy. Didn't you know? After all, they're supposed to be labor-saving devices. And the labor they're supposed to save is *mental* labor. So when we use computers, we think less, and we get lazy.

Simple, eh? Except it's not true. Anyone who uses computers intensively will stare blearily at you and swear that computers aren't making them work less. In fact, they're working harder—much harder.

It's true. Think about it. Human bosses are just that—human. They work a full day; then they quit and go home. Even when they're at the office, they're not hanging over you every minute, tapping their fingers, waiting for you to keep working. But computers—oh my! Once you turn them on, their little crystal clocks rev up to a million beats a second, and they're ready for you to work. You can put in a solid eight-hour day, and the computer won't even be winded. It's ready for more work. So you take the computer home and try to appease it by working another four hours.

Does this satisfy the beast? Not by a long shot. It sits there with its little cursor blinking, like a perky puppy waiting for more play.

Every day we push ourselves a little harder, trying to keep up with our computers. But it's a losing battle. So, computer manufacturers, hear my cry: Please make a computer that, after a lengthy session, flashes "Good work! I can see you'd like to keep going, but I'm pooped! How about a break? After all, tomorrow's another day."

Desktop Foods

By now, we've all heard of desktop publishing. It's so popular that it has spawned a lot of other terms, all beginning with the word *desktop*. There are desktop presentations, desktop communications, and even desktop videos.

Have you wondered where this desktop mania will end? Can you imagine the computer designers who spend all their waking moments "on the desktop," who see the world as a giant desktop, and who are forever dreaming up new desktop applications?

We're already doing our work at the desktop. Maybe in the near future the desktop can go with us and become a part of all our daily activities. For example, imagine what "desktop eating" would be like. When we get hungry, we'll just click on a little icon of a refrigerator. The refrigerator door will open, and we'll click on pictures of soda pop, candy bars, and sandwiches, to "select" our snack. Then the pictures will pop open and display the number of calories consumed, and the vitamins (if any) we're getting. Productivity consultants will recommend desktop eating to corporate management because it will replace costly coffee breaks and lunch hours, since workers will be able to do their eating at the desktop.

Beware of Computer Mouth!

During a busy day at the desktop, we have all experienced that awful sensation known as "computer mouth"—a sour taste that arises from trying to find a pesky program bug or from struggling to make our printer ignore the formatting glitches. When computer mouth strikes, you should hightail it to the restroom and whip out a toothbrush. But, if you have "desktop toothbrushing" installed as a DA (Desk Accessory), you just click on the little icon of the toothbrush. Instantly you see a picture of a little person (that's you) actively brushing, and smiling a great big smile with gleaming, pearly whites.

And at the end of a long, grueling day on the desktop, what could be nicer than taking your computer home, resting it on your lap in the living room, and taking in some desktop movies? Demi Moore may not look the same, but it sure beats renting a video or going to the theater. After all, when you're hungry, you just press RESTORE and order up a round of desktop Cokes and a tub of desktop popcorn.

Piracy: The Readers Speak Out

Todd Heimarck
Contributing Editor

On the subject of software piracy in this column ("The Software Police," March 1988), many GAZETTE readers responded very passionately on both sides of the issue. Herewith, their comments.

To Pirate . . .

When I read your article on piracy, I almost died of laughter. I have over 300 games and around 100 more other programs. Five of them I bought; the rest are pirated. The pirated programs include *GEOS, Print Shop, Newsroom, Project Stealth Fighter, Elite,* and *Fast Hack'em.* I'm just a high school student, and I cannot afford to buy a $40 program. I have to dig deep in my pocket just to pitch out $3 for your magazine. I have over $2,000 in software; it's crazy to spend that much on software. You say I could always get public domain software. What a joke; PD programs are not worth a dime. They're the programs kids write and put up on a BBS. If they were any good, they would write to a software company or a magazine.

Because of copy-protection, I have wanted to learn how to crack. I have become a much better programmer. I've mastered BASIC, ML, and Pascal. If I had decided to follow the "law," I never would have been interested in programming.

—DL, Nebraska

I have a complete 128 system and about $2,500 worth of software. I have purchased four or five titles. For us hourly workers, there's just no other way to be able to enjoy computing at all.

—Anonymous, Alabama

Being a software pirate myself, I felt compelled to write. You're absolutely right, of course; piracy is thievery. Since most pirates are like me, honest enough to return a lost wallet, why do we do it? I have a few theories. First, I think a lot of us use it as a means to exercise the larcenous part of our nature, a chance to do something wrong, to thumb one's nose at a faceless authority. Second, it's a challenge. It's a game with few rules, fewer reliable guidelines, and only one way of winning: obtaining a working copy. There's a definite kick to seeing a copy fire up for the first time. Third, it's an ego trip. Witness the bragging opening graphics on many of the cracked games going around. Finally, having a huge software library is usually regarded as quite a status symbol. Note that I didn't mention that it's an easy way to obtain programs. Most avid pirates have hundreds of disks, more than they can ever use.

Maybe the only answer is to forbid copying for any reason. I believe the typical pirate uses one of the many nibblers and parameter copiers to make his copies. Banning nibblers would certainly cut down on your ad revenue. One of the better nibblers was advertised on the same page as your article.

—Anonymous, Ohio

To think that people will pay money when they can get something for nothing is way off. Face it, it's easy and it's free. If software companies can't come up with good copy-protection, that's their problem. Morals are a thing of convenience and are best abandoned altogether.

—CE, Texas

. . . Or Not to Pirate?

It is unfortunate that most home computer users are not aware of the bargains in excellent commercial software available to them. Programs that cost tens of thousands of dollars to produce are available for a few dollars, because of the large market for them. If piracy could be eliminated, the increased market would reduce the cost even more.

—BW, Michigan

I am writing to say that the article is the most sensible statement I've read on the subject. I salute you for calling piracy exactly what it is—stealing—and, more importantly, for saying in print that it is immoral, not just illegal. This is an ethical issue, and it is right in front of many youngsters. How can we expect them to understand piracy is wrong when we don't tell them so, or (worse) when our example doesn't show them so? How many of us adults use pirated software (myself included)? To say nobody is hurt is foolish. There is no such thing as a free lunch. Somebody has to pay, sometime, somehow. Thanks for saying what you did.

—JDJ, Pennsylvania

I have the ability to copy virtually any type of software, including some of the most highly protected. I back up my own programs, which I believe we all have a right to do. I don't believe copiers and protection strippers should be used to furnish everyone in town with a copy, however. Piracy not only grates against my moral attitude but, as you pointed out, it is illegal.

—RF, Kansas

I would like to clarify one point you made. Making a copy is not *per se* an infringement of copyright. The copyright law of 1976, which went into effect in 1978, unintentionally made it illegal to load a program into a computer, because the definition of *copying* included the copying of software from disk to memory. The law was amended in 1980. In addition to making it legal to load (copy) a legally obtained program into your computer, the amendment allows the making of an archival copy (as you noted). It also allows the revising of software, if it is necessary to do so to use it on

your computer.

I agree with all you say. If someone has the intelligence and ability to write a worthwhile program, he or she is entitled to make a profit from it. The better the program, the more the profit should be.

—EPV, Illinois

About five or six years ago, I bought my first computer, a VIC-20. I soon realized that I could make copies of cassette games with a dual cassette stereo. So I did, and gave all my best games to friends and sold them to kids from school, charging $3 and a blank tape. Then I went even further. I actually ran an ad in the local newspaper that offered two or three VIC games on one cassette for $5–$10. I made over $900 in three days! To a 15-year-old, that's a lot of money. Now the tables are turned. I am a programmer, developing real estate applications for a small company. I get paid each week for the programs I write. I can imagine what it would be like to have a percentage of my pay taken away because of pirates. Now I realize what harm I was doing.

—MX, Florida

Software Companies: The Real Pirates?

I do *not* agree with piracy. However, I *do* have a copy program for protected software and I am planning to update (Electronic Arts is driving me crazy). Why do I want to copy software if I'm against piracy? You mentioned it in your article: archival purposes. I've got three kids who are real sticky-fingered threats to software, but I'm not about to ban them from the computer. They range from 4 to 13 years old. What I want are backup copies.

—DC, Texas

You seemed to miss an important point about copying—why it's done. Clearly, software is copied illegally so that one can avoid paying for it. And you forgot to mention that the term "piracy" can also apply to software pricing. If every program were $9.95, then almost nobody would be copying programs illegally (except really poor people, who probably don't have computers in the first place).

—JBM, North Carolina

I purchased my 64 several years ago, along with a few games my children requested. This introduced me to the use of disk errors as protection. My disk drive was unmercifully beaten to a premature death by this form of protection. This forced me to learn how to crack games, to remove the errors and lengthen my drive's life. I wrote letters to all the major software companies, explaining that their protection schemes were beating my drive to death. I got one response. They said they couldn't help my problem and that their foremost concern was to protect their programs. I got fed up with the fact that software companies don't care about users and started to learn more and more. I put up a BBS that turned out to be one of the biggest and best in the country. I am now a *major* pirate and will continue to be one with the same conscience that the software companies have about knocking equipment out of alignment and costing us money in repairs. I would not be a pirate today if it were not for the software companies and their irresponsible attitude toward the users. I can honestly say there are no programs reviewed in *GAZETTE* I don't already have.

—RAF, New Jersey

Recently, I downloaded a 128 database. It seemed like a very good program. The drawback was that it would only handle 20 records. I was able to run it, test it, and judge if I wanted it. If I decided to buy the database, there was an address. For $49.95, I could purchase the full-scale program with no limits on records, plus manuals, plus updates, plus support. Software publishers should consider selling a test disk at cost and then waiting for orders.

—RH, Illinois

Your holier-than-thou attitude concerning piracy irritates me more than pirating does you. I have not pirated in the past because it might be illegal and I once thought it was immoral. However, now I have my doubts as to whether pirating from a pirate is immoral. The pirates I'm talking about are the software companies who sell software with bugs or the ones who misrepresent their products in advertising and packaging. And those reviews in your magazine—if you told the truth about some of these products, you would not have the advertisers; therefore, you couldn't bring us those "hard-hitting" reviews.

—JJT, West Virginia

What about the poor user who wastes hundreds of dollars on software that doesn't live up to the hype of the ads? Software that crashes with one keypress, word processors with fewer features than a typewriter, and databases that make you long for 3 × 5 index cards—that's what makes people copy software. I know several people who have pirated software. They always bought the program if they enjoyed it. If not, the disk was promptly formatted.

—JS, Maryland

On the Chin

What kind of hypocrites are you? Why do you criticize the pirates when you sell them the tools to ply their trade?

—CES, Vermont

If you want to stop piracy, the only way to do it is to stop selling nibblers. To stop selling nibblers, you have to stop advertising them like the greedy, money-sucking scum you are! Sure, there's always a need for backup copies, but can't the rich software companies afford to pack two of the same disk in a software package? I'm sick and tired of hearing only one side of this controversy—the side spoken by the huge monopolies. If you have any guts, you'll print this letter.

—AE, New Jersey

Reprint Piracy?

I thought the March "Horizons" column was very well written and made some good points about the illegality and immorality of copying software. I liked it so much, I was going to make some photocopies and pass them along; maybe even copy it onto a local BBS. Then the irony hit me. If I copied your article, even though my motives were pure, wouldn't that also be piracy?

—KL, Alabama

Written permission for reprinting is required. We may charge a reprint fee, although we often do not.

simple answers to common questions

Tom R. Halfhill

Each month, COMPUTE!'s Gazette tackles some questions commonly asked by Commodore users. If you have a question you'd like to see answered here, send it to this column, c/o COMPUTE!'s Gazette, P.O. Box 5406, Greensboro, NC 27403.

Q. I have a Commodore 128 and have recently begun using its CP/M capabilities. In the documentation for various programs, I have repeatedly come across the term *overlay*. I am baffled by this term. What is an overlay, and how do you find them within programs? For example, my terminal program says to use the phone library overlay to change the numbers. There is no file that comes up when the DIR command is used that says anything about being an overlay file. I am stumped.

A. Neglecting to define a term which may be unfamiliar to the reader is a common pitfall in explanatory writing; we know, because it happens to us all the time. In this case, the author of your terminal program's manual assumed you were familiar with a term that was quite common a few years ago but is seen less often now.

Until very recently, programmers were severely cramped by the amounts of random access memory (RAM) available in personal computers. RAM is the part of the computer where a program is temporarily stored when loaded from disk or tape. As long as the computer remains powered up, RAM retains the information loaded into it. The more RAM available in a computer, the larger the programs it can run. In addition, most programs that let you create or process information—such as word processors, spreadsheets, database managers, and so on—also use RAM as a temporary workspace to hold your information until you save it on disk or tape.

Because RAM is so useful, the power of a computer is often defined in terms of how much RAM it has. The more RAM, the more power.

CP/M (Control Program/Microcomputers) is an operating system that's been around since the late 1970s. (An *operating system* is a master control program that's always active while the computer is switched on; it takes care of numerous housekeeping tasks that allow the computer to run other programs for you.) Because CP/M was designed in the 1970s, its power is limited by the hardware that was available then. To be specific, it was designed to run on the Z80 microprocessor chip, which can't directly access more than 64K of RAM at a time (1K = 1024 bytes, roughly equivalent to 1024 characters).

The Commodore 128, in addition to having a microprocessor chip that's compatible with the Commodore 64, also has a Z80 chip. That's why this multipurpose computer can run CP/M and programs written for CP/M. But even though the Commodore 128 contains 128K of RAM, its Z80 chip is still limited to directly addressing only 64K of that memory, just like any other Z80.

Although 64K was considered a lot of memory in the late 1970s, it just isn't enough to run some large programs. For instance, your terminal program evidently needs more than 64K. To get around this limitation, the programmer resorted to a technique that was common in the days when computers had only 64K or less memory: *overlays*. Overlays allow a program to be much larger than the amount of memory available in the computer.

An overlay is a section of a program that normally isn't loaded into memory along with the main part of the program. Instead, it's loaded into memory only when needed. The main program is written to fit in memory with a little room to spare. Whenever necessary, it then loads the overlay into this spare memory to perform a certain function. A program may have several overlays waiting on disk. As each overlay loads, it replaces the previous one in memory.

Overlays usually perform some auxiliary function that isn't central to the main program. That way, you don't have to wait for them to load from disk any more often than necessary. In some cases, though, a large overlay may also replace the main program in memory, requiring you to rerun the main program after using the overlay.

Overlays are less common now that personal computers routinely come with anywhere from 512K of RAM to four megabytes (one megabyte equals 1024K). Still, overlays will probably be around as long as programmers keep writing memory-hungry programs.

Generally, a program automatically loads the appropriate overlay when you select the function it performs. Some programs, however, require you to load the overlay yourself. It sounds like your terminal program expects this. There should be an overlay file on the disk, and it should be a program file, most likely shorter than the terminal program.

Check your manual again for any instructions on loading overlays or any explanation of the files on the disk. If you draw another blank, it's possible the overlay was inadvertently left off the disk or the instructions were omitted from the manual. Your best bet would be to contact the software publisher.

geoPaint Super Chart

E. William Huffman

To get the most from* geoPaint, *you need a chart showing the maximum possible sizes for a document, a normal-edit window, a pixel-edit window, and an album page. This month's column shows you how to construct just such a chart.

GeoPaint is undoubtedly one of the most-used *GEOS* applications, but it's sometimes difficult to get your bearings when creating a document. What size, for example, is the pixel-edit window when compared with an entire document page? When you fill the normal-edit window with a pattern, how much of a page will be used? The *geoPaint* reference chart described in this column will help solve all these problems. Making a chart like this is also an excellent way to get acquainted with some of *geoPaint*'s editing features.

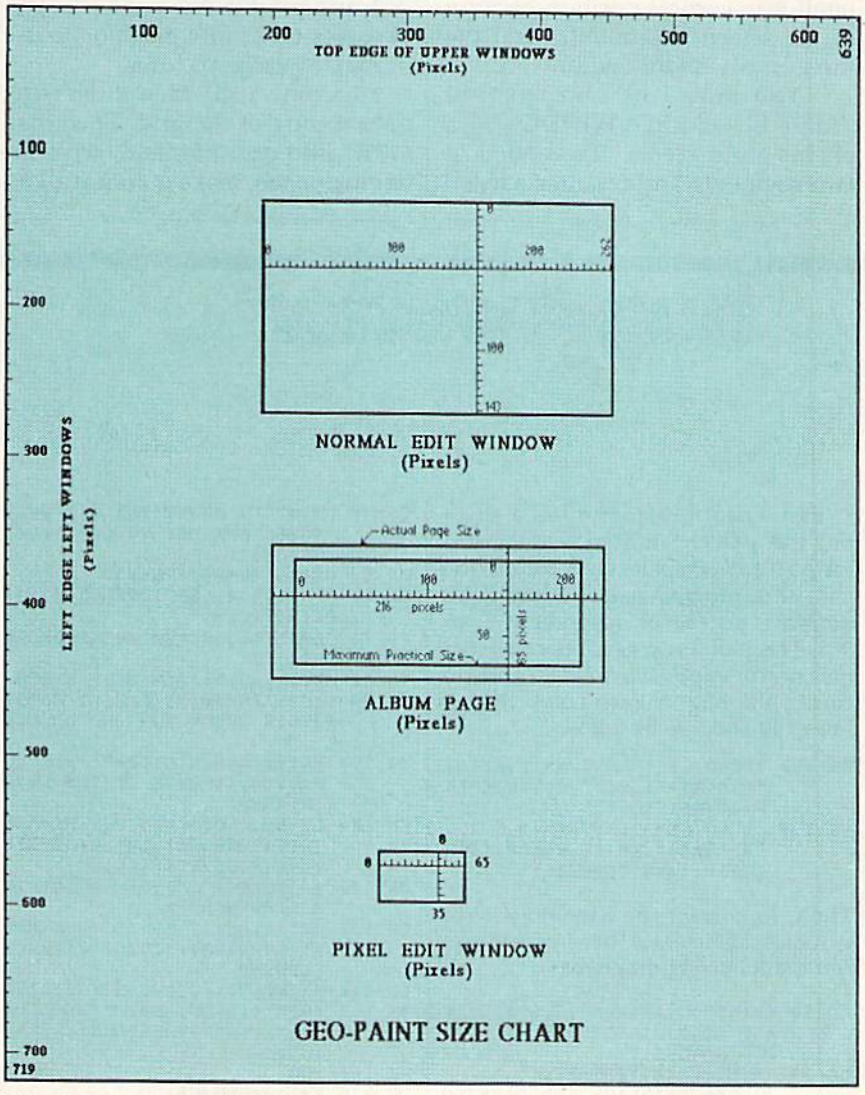
Making the Chart

First, boot *GEOS* and load *geoPaint*, telling the program you're going to create a new file with the name SCALES. Now, take just a moment to look at the accompanying reference chart. The chart has an outline with pixel scales along its top border and down the left side. Inside this area are scaled representations of a normal editing window, an album page, and a pixel editing window.

Start things off by outlining the document. You may want to experiment with both normal- and pixel-edit modes for drawing the outline. Be sure your pencil is drawing at the extreme edge of the normal-edit window to get a true size for the page. Because single pixel-width lines are very thin, you might try using a double pixel line, but for accuracy, measure to the outer one. The *GEOS Manual* explains moving windows around to make all outside edges available.

Next, draw a short line of three pixels at ten pixel intervals along the left and the top edges. You'll need to do this in pixel-edit mode. Use the ruler or tape measure to check the scale markings or count. Make slightly longer marks every 50 pixels and still longer ones every 100. Examine the accompanying chart for guidelines. If you're ambitious, you might want to place scales along the right and bottom edges of the document, too.

With the text-edit feature, place the appropriate numbers along the top and left sides of the chart. When you've finished this step, save this file (you may find a chart with just these measurements on it useful). Now, bring SCALES back to the screen and rename it CHART. Next, we'll add the normal-



This chart makes it easy to navigate geoPaint.

edit window, the album page, and the pixel-edit window to the chart.

Adding the Windows

Discovering the largest possible album can be time consuming. You need to make long horizontal and vertical scales and to experiment by placing them on an album page. Experimentation determined that the maximum size of the page is 250 × 85 pixels, but it's impossible to place a graphic of this size in the album because of limitations in the selection process. The practical limit for album pictures is about 216 × 65 pixels.

Now draw the normal-edit window using a rectangle of 262 × 143 pixels. Please note that, although you can fill this window with a graphic, if you do, you won't be able to rotate it. Text or any graphic larger than 125-pixels long horizontally probably can't be rotated to a vertical position because of the selection limitation and the more narrow window dimension.

You may find the caption "LEFT EDGE LEFT WINDOWS" a challenge to create. It's rotated in two segments and requires several moves before everything is aligned correctly. Each move is in eight-pixel jumps, so this can be a time-consuming process.

After you've created the document, including all captions, print a hard copy and save the file to disk. Now you can visualize exactly what portion of your picture is displayed in the editing windows, an album page, or the entire document. Larger drawings are no problem, except for album pages. Segments drawn in pixel- or normal-edit modes can be rearranged to make larger pictures.

The Grid

Bring the SCALES file into *geoPaint* and rename it GRID (leave SCALES on the files disk for future use, however). Now extend all the ten-pixel marks across the document both horizontally and vertically. Save the completed document to the files disk and print it. Next, make several copies on a copy machine to use in making large pictures.

Layout and trace a drawing onto a copy of the grid. Then load GRID into *geoPaint*, and, with the editing pencil, make marks at all intersections in pixel-edit mode. You'll need to make identification marks near key intersections so they can be seen in the pixel-edit window. With enough intersections marked, proceed to outlining the small portion of your drawing in the pixel window and watch your creation come to life in the small window to the left of the status box. When you're satisfied, erase all the unwanted grid pixels and move to an adjacent area to continue your artwork. When you've finished, you'll have mastered an important new technique.

A complicated graphic can be laid out on a hard copy of your GRID or, if you don't relish erasing all those grid lines, on a hard copy of SCALES. When the master layout is finished, simply load the appropriate *geoPaint* file and use corresponding reference points on the master to position graphics and text on the screen. Be sure to rename the new document and to erase all the unwanted grid or reference lines, numbers, and so on, before saving and printing.

bug-swatter

Modifications and Corrections

• "Easy Load" (February) has a slight bug that prevents it from working correctly. It adds graphics characters to the end of the program names in the disk's directory instead of appending ,8: or ,8,1. This problem makes the converted files nearly impossible to load. First, to correct the bug in Easy Load, change lines 180 and 190 as follows:

```
KB 180 IFCHOICE=1THENOPEN15,8,15,
       "R:"+A$+"{SHIFT-SPACE}{D}8
       @=:"+A$:CLOSE15
RG 190 IFCHOICE=2THENOPEN15,8,15,
       "R:"+A$+"{SHIFT-SPACE}{D}8
       {D}1=:"+A$:CLOSE15
```

Then, to correct the filenames with graphics characters in them, type in and run the following program:

```
QQ 10 PRINT"{CLR}{RVS}{5 SPACES}E
      ASY LOAD DIRECTORY CORRECTO
      R{6 SPACES}"
DE 20 PRINT:PRINT:PRINT"
      {3 SPACES}PLACE THE DISK TO
       BE CORRECTED IN"
MM 30 PRINT:PRINTTAB(11)"DRIVE 0
      {SPACE}OF UNIT 8."
QR 40 PRINT"{3 DOWN}"TAB(6)"{RVS}
       PRESS ANY KEY TO CONTINUE
      {SPACE}"
RX 50 GETK$:IFK$=""THEN50
FE 60 OPEN1,8,0,"$0":OPEN15,8,15:
      PRINT"{CLR}"
FP 70 GET#1,A$,A$:REM LOCATION BY
      TES
RQ 80 GET#1,A$,A$:REM LINK BYTES
KG 90 S=ST:IFS<>0THENCLOSE1:GOTO1
      50:REM CHECK FOR END OF FIL
      E
KE 100 GET#1,LO$,HI$:C$="":REM LO
       W BYTE,HI BYTE OF THE LINE
        NUMBER
FH 110 LO=ASC(LO$+CHR$(0)):HI=ASC
       (HI$+CHR$(0)):LN=LO+HI*256
       :LN$=MID$(STR$(LN),2)
DR 120 PRINTLN$+" ";:REM PRINT TH
       E LINE NUMBER
BB 130 GET#1,B$:IF B$="" THEN PRI
       NT CHR$(13);:GOTO170:REM F
       ILENAME
ED 140 PRINT B$;:C$=C$+B$:GOTO130
BM 150 INPUT#15,EN,EM$,ET,ES:CLOS
       E15:IFEN<>0THENPRINTEN;EM$
       ;ET;ES
MX 160 END
PE 170 I=1:J=LEN(C$)
EA 180 IF(MID$(C$,I,1)<>CHR$(34))
       AND(I<>J)THENI=I+1:GOTO180
JA 190 IF(MID$(C$,J,1)<>CHR$(34))
       AND(I<>J)THENJ=J-1:GOTO190
DS 200 IF I=J THEN80
XS 210 J=J-4:IFMID$(C$,J,4)=" {D}
       8@"THEN240
DC 220 J=J-1:IFMID$(C$,J,5)=" {D}
       8{D}1"THEN250
ME 230 GOTO80
GR 240 I=I+1:D$=MID$(C$,I,J-I):PR
       INT#15,"R0:"+D$+"
       {SHIFT-SPACE}{D}8@="+D$+"
       {SPACE}{D}8@":GOTO80
AK 250 I=I+1:D$=MID$(C$,I,J-I):PR
       INT#15,"R0:"+D$+"
       {SHIFT-SPACE}{D}8{D}1="+D$
       +" {D}8{D}1":GOTO80
```

You will be prompted to place the disk containing the corrupted filenames into drive 0 of unit 8 (a 1541 as it comes from the factory is drive 0 of unit 8). Place the disk to be corrected into the drive and press any key. All the filenames that were corrupted by Easy Load will be corrected. Filenames that weren't corrupted by Easy Load are not affected by the correction program, so don't worry if you place the wrong disk in the drive.

So you can code circles around the pros, eh? Well, here's your chance to prove it. It's the GEOS Programming Contest. And all it takes to win is a Commodore and your skill at programming under GEOS to win in any four categories and walk away with all kinds of prizes.

Including a check for $1,000.

Just send us the GEOS-based program you're most proud of—on disk—by August 31, 1988. There are four categories, each with an Applications[1] and Desk Accessories[2] winner. Which means that there are eight first prizes. Eight second prizes. And eight thirds.

And each prize consists of lots more prizes.

YOU WRITE THE PROGRAM, WE'LL WRITE THE CHECKS.

The GEOS Programming Contest.

We may not be the only ones writing checks.

And that's only where the bucks start. Because if your program makes it into a GEOS Shareware Library, all kinds of satisfied users may be writing you checks.

So boot up and get down to pumping out your most professional GEOS program. Then send it in with the information required below. Who knows? We could be sending a check right back to you.

1. Applications are identified by the GEOS Application File Type, are entered from and exit to the deskTop and conform to the GEOS user interface.

2. Desk Accessories are defined as programs which are less complex than applications, are identified by the GEOS Desk Accessory File Type, may be entered and pop-up within any application and upon exiting return the application to its prior state.

Categories

ENTERTAINMENT—Includes entertainment and games. For example, a Chess game (Applications Division) or a trivia game (Desk Accessories Division).

EDUCATION—Primarily educational and instructional. For example, a world geography program (Applications Division) or a flash card program (Desk Accessories Division).

PRODUCTIVITY—Designs that improve personal productivity. Examples include an "outline processor" (Applications Division) or a scientific or financial calculator (Desk Accessories Division).

OPEN PROGRAMMING—Open design category that includes programs not covered in other categories. Examples include disk utilities, printer and input drivers and telecommunications programs.

Over $25,000 in cash and prizes!

Eight First Prizes!
- $1,000 cash
- Announcement in Compute!'s Gazette Magazine
- Complete library of C64 or C128 GEOS applications from Berkeley Softworks
- Commodore peripherals: 1670 1200 Baud Modem, 1351 Mouse and 1764 or 1750 RAM Expansion Module
- Six month subscription to Q-Link, the telecommunications service and Q-Link's Public Domain Software Library from Quantum Computer Services
- Twelve month subscription to Compute!'s Gazette magazine

Eight Second Prizes!
- Announcement in Compute!'s Gazette Magazine
- Complete library of C64 or C128 GEOS applications from Berkeley Softworks
- Commodore peripherals: 1670 1200 Baud Modem and your choice of a 1764 or 1750 RAM Expansion Module or 1351 Mouse
- Three month subscription to Q-Link, the telecommunications service and Q-Link's Public Domain Software Library from Quantum Computer Services
- Twelve month subscription to Compute!'s Gazette magazine

Eight Third Prizes!
- Announcement in Compute!'s Gazette Magazine
- Your choice of any five C64 or C128 GEOS applications from Berkeley Softworks
- Commodore peripherals: 1670 1200 Baud Modem and your choice of a 1764 or 1750 RAM Expansion Module or 1351 Mouse
- Three month subscription to Q-Link, the telecommunications service and Q-Link's Public Domain Software Library from Quantum Computer Services
- Twelve month subscription to Compute!'s Gazette magazine

Official Rules

1. Employees of Berkeley Softworks, Quantum Computer Services, Laser Direct, Compute!'s Gazette Magazine, their advertising and promotional agencies and their immediate families are not eligible to enter the contest.

2. Each entry must be your original work, previously unpublished in any form. All those programs accepted will be required to affirm this in writing.

3. Contestants may enter multiple categories, but may only submit one entry per category per division (e.g. one entry in the Entertainment category Applications Division, *and* one entry in the Entertainment Desk Accessories Division). Regardless of the number of categories you enter, you will only be eligible to win one prize.

4. Deadline for entries is August 31, 1988. Mail entries to Compute!'s Gazette, P.O. Box 5406, Greensboro, NC, 27403
Attn: GEOS Programming Contest.

5. Acceptance of an entry shall not create any implication that the entry has been received and reviewed by Berkeley Softworks or has been used in any way in product development.

6. Judging will be performed by the staff of Compute!'s Gazette Magazine. The decisions of the judges are final in all respects. This includes decisions regarding creativity, similarity among entries and general suitability.

7. Entries become the property of Berkeley Softworks, which reserves the right to adapt, use or publish all entries received. Entries may become part of a "shareware" library to be distributed by Berkeley Softworks, Compute!'s Gazette and Quantum Computer Services. As part of each submission, contestants should include *in* the program their name, address and a "user fee" amount for satisfied users to send a discretionary payment.

8. Entries may be written in any programming language but must be a GEOS based program supporting the GEOS file structure and be executable from the GEOS deskTop or a GEOS application. Whichever language is chosen, the code must be a self-standing program that can be run by someone who does not own the language. We must be able to legally distribute the program without incurring licensing fees or any other obligations to the maker of the language.

9. Entries must be submitted on 5.25" floppy disks in 1541/1571 format. The following should be clearly marked on both the printout and the disk:
A. Contestant's name, address and phone number.
B. Category and division for the entry.
C. Intended use for the program.

10. Entries must be accompanied by a description which explains how to use the program and what it does.

11. This contest is void where prohibited by law. All federal, state and local taxes are the sole responsibility of the winners.

General Conditions

- Entries will be judged on creativity, originality, interface consistency with other GEOS programs and error-free quality of the code.
- Make sure your mailer will protect your disk from damage. Affix sufficient first class postage. Mail your printout, disk and official entry blank to the above address in time to reach Compute!'s Gazette Magazine before the August 31, 1988, deadline.
- Winners will be announced by October, 1988.

Sponsored by Berkeley Softworks and Compute!'s Gazette.

PLEASE PRINT

Name _____

Phone _____

Address _____

_____

City _____

State _____ Zip _____

Age _____

EVERY CONTEST ENTRY MUST INCLUDE THIS SIGNED FORM:

I warrant that the program presently entitled is my own original work and that the work has not been submitted for consideration elsewhere, nor has it been previously published in any form. If my work is accepted by you, I understand that your decision as to the selection of winners and awarding of prizes is final and without recourse on my part. I understand that by entering this contest, my entry becomes the property of Berkeley Softworks and in the event my program is included in a shareware library, I will be required to sign a standard release agreement. (If you are under 18, your parent or legal guardian must sign for you.)

Signature _____

Berkeley Softworks

The brightest minds are working with Berkeley.

Ramdisk 64

Bruce Thompson

This short machine language utility creates a ramdisk in the 64's "hidden" memory, allowing you to load and save programs instantaneously—and it provides over 20K of storage.

BASIC programmers rarely tap the great expanses of memory in the Commodore 64. For instance, both BASIC and Kernal ROM (Read Only Memory) have an 8K chunk of RAM (Random Access Memory) beneath them. "Ramdisk 64" lets you use this RAM (along with the 4K block of free memory at location 49152) for temporary storage of BASIC programs. No longer will loads and saves depend on the speed of your tape or disk drive. With Ramdisk 64, you'll have instant access to as many programs as you can fit in 20K of RAM.

Installing the Ramdisk

Since Ramdisk 64 is written in machine language, you'll need to enter it with "MLX," the machine language entry program printed elsewhere in this issue. When you load and run MLX, respond to the address prompts with the following values:

Starting address: 0801
Ending address: 0A50

After you've typed in the program, save a copy to disk or tape before leaving MLX. Even though it's written in machine language, Ramdisk 64 loads and runs like a normal BASIC program. Thus, to install the ramdisk, simply load the program, type RUN, and press RETURN. When the cursor reappears, type NEW and press RETURN. The ramdisk is now active and ready for use.

RAM Power

The ramdisk you've installed operates much like a disk or tape drive. It assumes a device number of 2 (a disk drive is normally device 8; a tape drive is device 1). So, to save a BASIC program to the ramdisk, use the command SAVE"*filename*",2 where *filename* is any string of 16 or fewer characters.

Once you've stored a number of programs in the ramdisk, enter LOAD"$",2 to produce a two-column directory of all the files currently in the ramdisk. This directory *does not* destroy the program that's in memory. At the end of the directory, you'll see a BYTES FREE message telling you how much memory is left in the ramdisk for additional programs. If you attempt to save a program that is longer than the space that remains, the save aborts with an OUT OF MEMORY error, and your BASIC program remains intact.

When you wish to reload a file from the ramdisk into the BASIC work area, type LOAD"*filename*",2 and press RETURN. If there is an appropriately named file in the ramdisk, it loads into memory (much as it would from tape or disk). To conserve memory, the program is erased from the ramdisk. For this reason, when you're finished working on a program you've taken from the ramdisk, be sure to resave it (either to the ramdisk, or to tape or disk) before loading another program. If you wish to delete a file from the ramdisk, just load it into memory.

Ramdisk 64 shares traits of both the disk and tape drive. For instance, if you're using tape for program storage, entering LOAD"C" will load the first program on the tape whose filename starts with the letter C. This technique works just fine with Ramdisk 64 (for example, LOAD"C",2 loads the first program in the ramdisk that begins with the letter C.)

With disk, this process is known as *pattern matching* and requires an asterisk (*). The ramdisk also recognizes this convention when loading files. For example, just as with disk, LOAD"*file**",2 loads the first file that begins with the letters *file*. In contrast, LOAD"*",2 *always* loads the first entry in the ramdisk directory. With disk, this is true only when no other program has been loaded yet. If a program has been loaded, LOAD "*",8 fetches the most recently accessed program.

As a convenience, Ramdisk 64 allows you to save multiple versions of a program using the same filename. This prevents you from accidently overwriting a program in the ramdisk. To recall a version of a program, simply load the program repeatedly until your most recent copy is in memory. Be sure to save other versions to disk or to the ramdisk if you wish to keep them.

How It Works

The Ramdisk 64 driver routine resides at the bottom of the BASIC text area. This allows utilities like "MetaBASIC" to operate undisturbed.

When it is run, Ramdisk 64 immediately protects itself from BASIC by adjusting the start-of-BASIC pointers upwards. Next, it stores the current ERROR handler vector at 768, redirects the vector to its own error handler, and exits to BASIC.

Henceforth, whenever a BASIC error occurs, the program checks for an ILLEGAL DEVICE NUMBER error. If this error took place, it assumes the user is attempting to access the ramdisk. The program then looks for a correct filename and loads or saves the specified program to the ramdisk workspace. Ramdisk storage extents from location $A000 to $FFFF, excluding the area from $D000 to $DFFF.

On the 64, certain device numbers other than 2 will trigger the ILLEGAL DEVICE NUMBER error (0, 3, and so on). These can also be used for ramdisk access. For example, both LOAD"$",0 and LOAD"$",3 produce a ramdisk directory listing.

See program listing on page 77.

Big Screen Converter

Robert Bixby

This companion program to "Big Screen," (a powerful 640 × 400-pixel drawing program for the 64, published in the March 1988 issue) makes ordinary DOODLE! *files—and BASIC 7.0 graphics screens—compatible with Big Screen.*

"Big Screen," published in the March 1988 issue of *COMPUTE!'s Gazette*, lets you create hi-res drawings on a virtual graphics screen that is 640 × 400 pixels—four times the usual screen size. With "Big Screen Converter," you can load graphics created with *DOODLE!* into Big Screen and handle them as you would other Big Screen files. Thus you'll be able to perform the kind of detail work allowed by Big Screen on your *DOODLE!* files.

Big Screen Converter is written in machine language for maximum speed. To enter it, you must use "MLX," the machine language entry program found elsewhere in this issue. When you run MLX, you are asked for the starting and ending addresses of the data you'll be entering. Here are the values to use with Big Screen Converter:

Starting address: 0801
Ending address: 0B70

Follow the MLX instructions carefully, and be sure to save a copy of the Big Screen Converter data before exiting MLX. Although written in machine language, Big Screen Converter can be loaded and run just like a BASIC program.

Converting *DOODLE!* Files

To convert a file, first load and run Big Screen Converter. The program asks you for a filename. Place a disk containing a *DOODLE!* file in your disk drive. Type the name of the *DOODLE!* file and press RETURN. Remember to add the DD prefix which precedes all *DOODLE!* filenames. (For example, if you save a hi-res picture as LANDSCAPE with *DOODLE!*, the file will appear in the directory as DDLANDSCAPE.) Be sure that you type a valid filename—if the program is unable to find your file, you'll have to load the program and run it again to ensure an accurate conversion.

Once you've entered the *DOODLE!* filename, Big Screen Converter switches to the hi-res screen and begins the conversion process. You'll actually see the first part of the picture load and expand until the limits of the normal hi-res screen have been reached (320 × 200 pixels). The screen border color flashes red and white during the conversion. When the process ends, the text screen reappears.

At this point, follow the instructions in the March *GAZETTE* to load and run Big Screen. Your *DOODLE!* file will be displayed on the graphics screen in an enlarged form—four times bigger than before. Using Big Screen's various modes and commands, you can now work on this expanded image. When you've finished, be sure to save a copy of it to disk.

Converting 128 Graphics

Big Screen Converter handles not only *DOODLE!* files; it also converts graphics screens saved from BASIC 7.0. Hi-res screens on the 128 are generally saved with the command BSAVE. For instance, the following statement saves the contents of the hi-res screen at 7168 to disk as the file "HR PICTURE":

```
BSAVE "HR PICTURE",B0,P7168 TO
  P16384
```

Once it is saved, you can convert HR PICTURE to Big Screen format by first switching to 64 mode. Next, load and run Big Screen Converter. At the filename prompt, enter "HR PICTURE". When the conversion is complete, load and run Big Screen and save a copy of the enlarged image to disk.

How It Works

After you've specified a filename (*DOODLE!* or BASIC 7.0 graphics screen), Big Screen Converter reads a byte of graphics data from the file and expands it to encompass four bytes. These four bytes are displayed on the 64's graphics screen beginning at 8192 before another byte is read from the disk. The normal graphics screen represents the first quadrant of Big Screen's 640 × 400-pixel canvas. The rest of the converted graphics data (the three remaining quadrants) is stored in 8000-byte areas beginning at 16384, 24576, and 32768. Big Screen Converter itself occupies a little more than 800 bytes of memory in the BASIC text area.

See program listing on page 75.

COMPUTER DIRECT
Will Not Be UNDERSOLD!
AND WE MEAN IT!*

Prices Expire 6-30-88

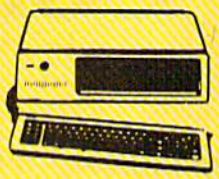
Super Fast* 15MHz IBM® XT Compatible Computer

The Incredibly Quick Professional XT Computer

SALE

Sale Price

****$449.95**



List $1195 (Add $10.00 shipping.*)

- *15 MHz (Norton CI Rating)
- Parallel, Serial & Game Ports
- TTL Monochrome Monitor Card
- 512K Professional XT Turbo Computer
- Super Fast V20 CPU
- AT Style Keyboard
- Security Keylock
- Clock Calendar

** Must be purchased with **MS DOS & G.W. BASIC** Software for an additional **$79.95.** (Not sold separately.)

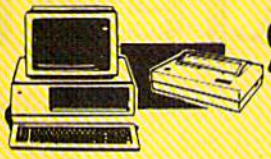
IBM® is the registered trademark of International Business Machines, Inc.

Complete *15MHz IBM® XT Compatible System

Computer, Drive, Monitor, Printer & Software

Sale

Sale Price



$659.95

Professional System List $2495 (Add $35.00 shipping.*)

No One Sells This System For Less!

- *15 MHz (Norton CI Rating)
- 512K Professional XT Turbo Computer
  4.77/8 MHz ; Clock/Calendar
  Parallel, Serial & Game Ports
- MS DOS 3.2 & G.W. Basic Included
- Hi-Res 12" Monochrome Monitor
- Genuine IBM 8½" Printer with Interface
  And Heat Transfer Paper
- Software: Word Processor, Spreadsheet & Data Base

IBM® is the registered trademark of International Business Machines, Inc.

Complete Apple® Compatible System

Computer, Drive, Monitor, Printer & Software

Sale

Sale Price

$479.95

List $1228 (Add $35.00 shipping.*)

No One Sells This System For Less!

- Laser 128K Computer
  Video, Parallel & Serial Ports
  Runs Virtually All of the
  Apple II/IIc/IIe Software
- Hi Res 12" Monochrome Monitor
- Genuine IBM 8½" Printer With Interface
  And Heat Transfer Paper
- Software: Word Processor, Spreadsheet & Data Entry

Apple® is the registered trademark of Apple Computers Inc.

Complete Commodore® 64c System

Computer, Drive, Monitor, Printer & Software

SALE

Sale Price

$395.95

List $1045 (Add $35.00 shipping.*)

No One Sells This System For Less!

- Commodore C-64c Computer
- Excelerator Plus Disk Drive
- Hi Res 12" Monochrome Monitor
  With Connecting Cables
- Genuine IBM 8½" Printer With Interface
  And Heat Transfer Paper
- GEOS Software: Word Processor And
  Drawing Program

Commodore® is the registered trademark of Commodore Business Machines Inc.

15 Day Home Trial • 90 Day Immediate Replacement Policy

COMPUTER DIRECT
22292 N. Pepper Rd, Barrington, IL. 60010
Call (312) 382-5050 To Order!

* Illinois residents add 6½% sales tax. All orders must be in U.S. Dollars. We ship to all points in the U.S., CANADA, PUERTO RICO, & APO-FPO. Please call for charges outside continental U.S. or C.O.D. **MAIL ORDERS** enclose cashier check, money order, or personal check. Allow 14 days delivery, 2 to 7 days for phone orders and 1 day express mail. Prices and availability subject to change without notice. Shipping and handling charges are not refundable. (Monitors only shipped in continental U.S.) **COMPUTER DIRECT** will match any valid nationally advertised delivered price on the exact same product with a comparable payment method (excluding any applicable sales taxes). A physical copy order of the current valid lower priced ad must be supplied with the order, or within 15 days of date of purchase. **VISA — MASTERCARD — C.O.D.**

COMPUTER DIRECT
Is 1st In PRICE, SUPPORT, & GUARANTEE!
WE LOVE OUR CUSTOMERS!

Prices Expire 6-30-88

Genuine IBM® Printer

8½" Letter Size • 80 Column
Limited Quantities

1st Come
1st Serve

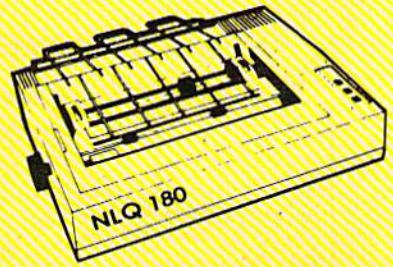
5¼" DS-DD Disks
Sale Price 19¢ ea.*
List 49¢ ea.
Min. Qty. 50 - Max Qty. 250
Sleeves 2¢ Min. Qty. 50

Sale $44.95
(Add $7.50 shipping.*) List $199

- Unbelievable Low Price
- Underline
- Advanced Dot Matrix - Heat Transfer
- Enlarged
- Upper & Lower Case (With True Lower Descenders)
- Graphics With Commodore, & Apple Interfaces
- Ready to Hook Up To Serial Port Of IBM® PCjr
- Low Cost Adapters For IBM®, Apple, Commodore, & Laser Computers

Hi-Speed NLQ Printer

Superb Near Letter Quality
160 — 180 CPS

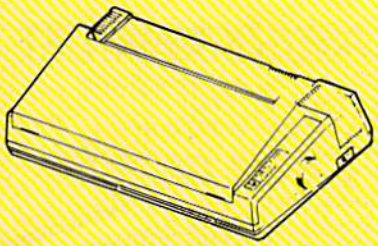


Sale $179.95
(Add $10.00 shipping.*) List $499

- High Speed Dot Matrix
- Near Letter Quality Selectable From Front Panel
- Italics - Elite - Condensed - Pica
- Tractor/Friction Feed
- Super Graphics
- Centronics Parallel Port
- 8K Buffer
- * Lifetime Warranty On Print Head
- 6 Month Replacement Policy For Printer

15" 160 CPS Printer

Star Micronics LV-1615 With High Speed And Near Letter Quality



No One Sells This Printer For Less!

Sale $229.95
(Add $14.50 shipping.*) List $499

- IBM Compatible
- Skip Over Perforation
- Continuous Underline
- Friction and Tractor Feeds
- High Res Graphics Printing
- NLQ and High Speed Draft
- Both Parallel and Serial Interface Ports Standard

Super Hi-Speed Printer

200 CPS Star Micronics LV-2010 With Crisp Near Letter Quality

No One Sells This Printer For Less!

Sale $199.95
(Add $10.00 shipping.*) List $499

- IBM Compatible
- Serial Impact Dot Matrix
- Near Letter Quality Mode
- Ultra High Resolution Bit Image Graphics
- 200 CPS Draft - 45 CPS Near Letter Quality
- Standard Serial & Centronics Parallel Ports
- Pull Tractor & Automatic Single Sheet Loading

15 Day Home Trial • 90 Day Immediate Replacement Policy

Call **(312) 382-5050** *We Love Our Customers!*

Mail **COMPUTER DIRECT**
22292 N. Pepper Road
Barrington, IL. 60010

Lyco Computer

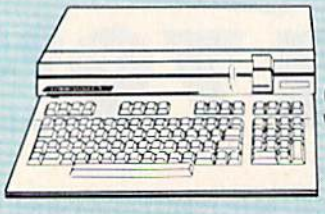
Marketing & Consultants

Since 1981

Order processed within 24 hours

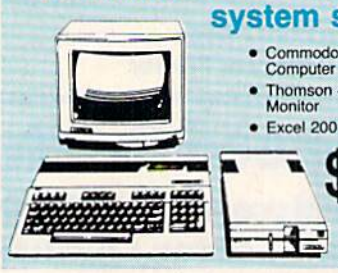
Order Early — Commodore Price Increases Possible

COMMODORE 128D System



$449.95

COMMODORE 128 system special



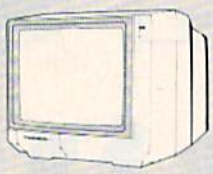
- Commodore 128 Computer
- Thomson 4120 Monitor
- Excel 2001 Drive

$609.95

Limited Quantity

THOMSON 4120 Commodore Ready Monitor

- Color Composite for 64 Mode Operation
- Color RGB for C128 Mode Operation
- Plus Switchable in Green Monochrome
- Cables Included



$225.95

BLUE CHIP PC

PERSONAL COMPUTER

- 4.77 Mhz speed
- Dual floppy
- Green monitor included

$579.95

COMMODORE HARDWARE

1541 II Disk Drive	$175.95
1581 Disk Drive	$189.95
Indus GT C-64 Drive	$169.95
1802C Monitor	$189.95
64 C Computer	$169.95
128D Computer/Drive	$449.95
C-1351 Mouse	$32.95
1700 RAM	$109.95
C-1750 RAM	$CALL
1764 RAM C64	$117.95
1084 Monitor	$279.95
128 Computer	$219.95
Excel 2001 C128 Drive	$199.95
Excel FSD-2+ C64 Drive	$149.95

Attention Educational Institutions:

If you are not currently using our educational service program, please call our representatives for details.

PC COMPATIBLE HARDWARE

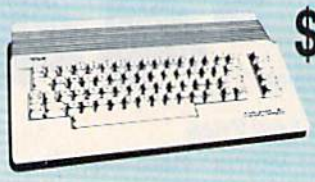
BCM 12G Gr. Monitor	$64.95
BCM 12A Am. Monitor	$69.95
BCC CG Color Card	$94.99
AST	$CALL
Laser Compact XT	$475.95
Laser Compact XTE 640K	$549.95
Laser Desktop Turbo XT 256K	$569.95
Laser Desktop Turbo XT 640K	$599.95
Laser EGA + 4 Card	$129.95
Kraft PC Joystick Card	$27.95
Zucker CGA ColorCard	$89.95
ATI Graphics Solution	$129.95
ATI EGA Wonder	$199.95
Thomson GB 200	$249.95
Blue Chip Popular	$CALL
Blue Chip 286AT	$CALL

Seagate HARD DRIVES

ST 225 20 meg Hard Drive	$215.95*
ST 251 40 meg Hard Drive	$399.95*
*DTC Controller Kit for PC/XT	$39.95
ST 238 30 meg Hard Drive	$249.95**
**DTC RLL Controller Kit for PC/XT	$49.95
ST 125 20 meg 3.5 Hard Drive	$289.95
DTC Controller Kit for PC/XT	$39.95
ST 125 20 meg Internal Card w/Controller	$349.95

Add $10.00 for Western Digital Controllers

COMMODORE 64C COMPUTER



$169.95

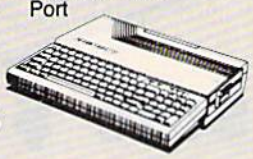
COMMODORE 64C System Special

- Commodore 64C Computer
- Commodore 1541 II Drive
- Seikosha Sp180VC Commodore Ready Printer

$469.95

LASER COMPACT XT

- PC-XT Compatible
- 4.77 - 8.00 Mhz Super Turbo Clock Speed
- Built-in 5¼ Drive
- Built-in RGB Video Output
- Parallel Printer Port
- Serial RS232
- Joystick/Game Port



ONLY **$475.95**

LASER Desktop PC

$569.95

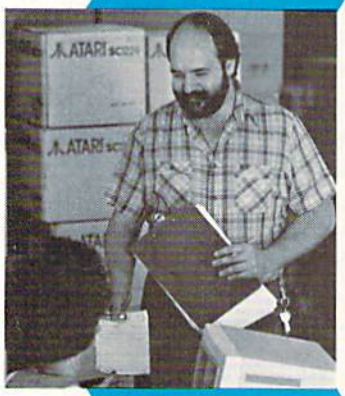
1-800-233-8760

Lyco Means Total Service

Mark "Mac" Bowser, Sales Manager

I would personally like to thank all of our past customers for helping to make Lyco Computer one of the largest mail order companies and a leader in the industry. Also, I would like to extend my personal invitation to all computer enthusiasts who have not experienced the services that we provide. Please call our trained sales staff at our toll free number to inquire about our diverse product line and weekly specials.

Call Lyco

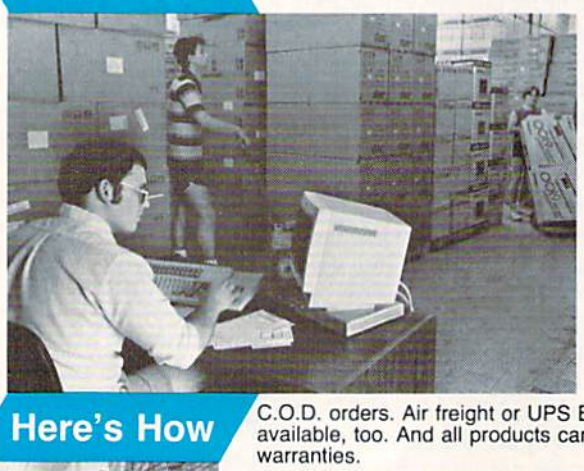


First and foremost our philosophy is to keep abreast of the changing market so that we can provide you with not only factory-fresh merchandise but also the newest models offered by the manufacturers at the absolute best possible prices. And we offer the widest selection of computer hardware, software and accessories.

Feel free to call Lyco if you want to know more about a particular item. I can't stress enough that our toll-free number is not just for orders. Many companies have a toll-free number for ordering, but if you just want to ask a question about a product, you have to make a toll call. Not at Lyco. Our trained sales staff is knowledgeable about all the products we stock and is happy to answer any questions you may have. We will do our best to make sure that the product you select will fit your application. We also have Saturday hours — one more reason to call us for all your computer needs.

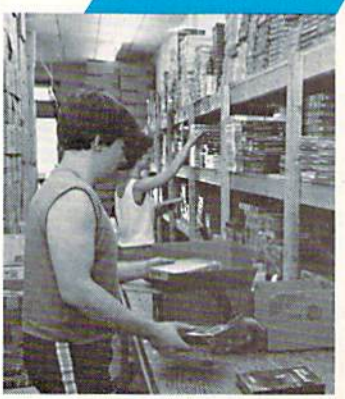
Order Now

Once you've placed your order with Lyco, we don't forget about you. Our friendly, professional customer service representatives will find answers to your questions about the status of an order, warranties, product availability, or prices.



Lyco Computer stocks a multimillion dollar inventory of factory-fresh merchandise. Chances are we have exactly what you want right in our warehouse. And that means you'll get it fast. In fact, orders are normally shipped within 24 hours. Free shipping on prepaid cash orders over $50, and there is no deposit required on C.O.D. orders. Air freight or UPS Blue/Red Label shipping is available, too. And all products carry the full manufacturers' warranties.

Here's How



I can't see why anyone would shop anywhere else. Selection from our huge in-stock inventory, best price, service that can't be beat — we've got it all here at Lyco Computer.

TO ORDER, CALL TOLL-FREE: 1-800-233-8760
New PA Wats: 1-800-233-8760
Outside Continental US Call: **1-717-494-1030**

Hours: 9AM to 8PM, Mon. - Thurs.
9AM to 6PM, Friday — 10AM to 6PM, Saturday

For Customer Service, call 1-717-494-1670,
9AM to 5PM, Mon. - Fri.
Or write: Lyco Computer, Inc.
P.O. Box 5088, Jersey Shore, PA 17740

C.O.D. Risk-Free Policy: • full manufacturers' warranties • no sales tax outside PA • prices show 4% cash discount; add 4% for credit cards • APO, FPO, international: add $5 plus 3% for priority • 4-week clearance on personal checks • we check for credit card theft • sorry, compatibility not guaranteed • return authorization required • due to new product guarantee, return restrictions apply • price/availability subject to change • prepaid orders under $50 in Continental US, add $3.00

MasterCard VISA

C64/128 Modem Value

- Avatex 1200e Hayes Compatible Modem
- Direct Connect Cable to Your C64/128
- Free Quantum Link Software

Only $89.95

Disc Storage

QVS-10 5¼	$3.95
QVS-75 5¼	$14.95
QVS-40 3½	$11.95

Generic Ribbons

Color Ribbons Available

Save up to 50% off brand prices! Call for your make and model!

Printer Interfaces

Xetec Jr.	$35.95
Xetec Supergraphics	$55.95
Xetec Gold	$89.95
PPI	$29.95
Cardco GWhiz	$32.95
Cardco Super G	$44.95
MW 350	$49.95
Xtra Long PC Cable	$CALL

Great Bargains

New M-3 Mouse

- Works with Geos
- 1351 Compatible

Call for Introductory Price!

Mouse Pads

- provides clean, dust-free surface for your mouse
- No-mar backing to protect your desk surface

9x11 .... $10.95

Mouse Cleaner $9.95

5-1/4

Disk Notche

Maxell:
SSDD .....
DSDD .....

Bonus:
SSDD .....
DSDD .....

SKC:
DSDD .....
DSHD .....
Generic DSD

Verbatim:
SSDD .....
DSDD .....

3.5

Maxell:
SSDD .....
DSDD .....

Bonus:
SSDD .....
DSDD .....

Verbatim:
SSDD .....
DSDD .....

SKC:
SSDD .....
DSDD .....
Generic SSD
Generic DSD

Joy

Tac 3 .....
Tac 2 .....
Tac 5 .....
Tac 1 + IBM
Economy ....
Slik Stick .....
Black Max ...
Boss .....
3-Way .....
Bathandle ...
Winner 909 ..
Wico IBM/AP
Lipstick Plus
Kraft KC III A
Kraft PC Joy
Card .....
Kraft Maze M

Dus

Pan 1081/10
64C .....
128D .....
Epson LX80
Seikosha Sp

P P

1000 sheet l
150 sheet ivo
150 sheet wh
1000 sh. Gr.
1000 mailing
200 sheet Ol
Transparent

Free shipp

skettes

... $5.95
... $7.95
... $8.95
... $5.95
... $6.95
... $6.95
... $13.95
... $4.95
... $8.99
... $11.50
... $11.50
... $17.95
... $10.95
... $13.95
... $12.95
... $18.95
... $9.95
... $13.99
... $9.75
... $12.95

sticks

... $9.95
... $10.95
... $12.95
AP ... $26.95
... $5.95
... $6.95
... $10.95
... $11.99
... $19.99
... $16.75
... $24.95
... $29.95
... $14.95
/PC ... $16.95
tick
... $27.95
aster ... $8.95

covers

1 ... $9.95
... $9.95
... $9.95
... $9.95
Series ... $9.95

inter aper

ser ... $16.95
y, 20lb ... $6.95
te, 20lb ... $6.95
ar 14" ... $18.95
abels ... $8.95
l 20 ... $8.95
abels ... $4.95

Surge Suppressors

PP102-6 outlet ... $16.95
PP106-6 outlet with EMI/RFI ... $28.95
PP104-6 outlet with indicator ... $19.95
PP101-6 outlet powerstrip ... $9.95

Drive Maintenance

5¼ Drive Cleaner CMP142 ... $7.95
5¼ Drive Cleaner with program ... $15.95
3.5 Drive Cleaner CMP 154 ... $10.95

Switch Boxes

Cent '25' AB ... $39.95
Cent '36' AB ... $39.95
RS232 ABC ... $45.95
Cent ABC ... $49.95
RS232 ABCD ... $49.95
Cent ABCD ... $49.95

Video Tape

SKC T120 VHS Video Tape:

each ... $3.99
3 pack ... $10.95
10 pack ... $35.95

Closeouts!

Factory Fresh Special Pricing Call for Availability

Quantum Link ... $SAVE
Computer Cover-up (dustcovers) ... $SAVE
Novation modems ... $SAVE
Anchor modems ... $SAVE
Certron ... $SAVE
Teknika Monitors ... $SAVE
Panasonic Monitors ... $SAVE
Dennison Diskettes ... $SAVE
Juki 6300 ... $SAVE

Great savings on Epyx, Cardco, Eastern House, High Tech Expressions, Timeworks, Spinaker, Scarborough, Continental, and much more!!

COMMODORE

Access:
Echelon ... $25.95
Mach 5 ... $19.95
Mach – 128 ... $28.95
10th Frame ... $22.95
Triple Pack ... $11.95
Wld. Cl. Leader Brd. ... $22.95
Famous Courses #1 ... $11.95
Famous Courses #2 ... $11.95
Leader Board Pack ... $14.95

Action Soft:
Up Periscope ... $18.95
Thunderchopper ... $18.95

Activision:
Champion. Basketball ... $19.95
Music Studio ... $19.95
Leather Goddesses ... $22.95
Top Fuel Eliminator ... $15.95
Beyond Zork ... $25.95
GFL Football ... $19.95
Gee Bee Air Rally ... $16.95
Last Ninja ... $19.95
Might & Majic ... $19.95
Nord & Bert ... $19.95
Aliens ... $25.95
Maniac Mansion ... $19.95

Batteries Included:
Paperclip III ... $31.95
Outrageous Pages ... $31.95

Berkeley Softworks:
Geofile C64 ... $29.95
Geo Calc C64 ... $29.95
Geos 64 ... $35.95
Geos 128 ... $39.95
Geowrite ... $29.95
Geowrite 128 ... $39.95
Geopublish C64 ... $39.95
Berkeley TriPak ... $29.95

Broderbund:
Bank St. Writer ... $27.95
Carmen San Diego ... $19.95
Graphic Lib. I, II, III ... $13.95
Print Shop ... $25.49
Print Shop Compan. ... $22.95
Cauldron ... $16.95
Superbike Challenge ... $11.95
Magnetron ... $14.95

Electronic Arts:
Marble Madness ... $20.95
Yeager's AFT ... $22.95
Demon Stalkers ... $20.95
Dragon's Lair ... $16.95
Skate or Die ... $20.95
Strike Fleet ... $20.95

Epyx:
Destroyer ... $22.95
Fastload ... $19.95
Sub Battle ... $22.95
Winter Games ... $11.95
California Games ... $22.95
Str. Sports Basketball ... $22.95
Summer Games II ... $11.95
World Games ... $22.95
Boulderdash Con Set ... $13.95
Rad Warrior ... $13.95

Firebird:
Elite ... $18.95
Guild of Thieves ... $22.95
Pawn ... $22.95
Tracker ... $22.95
Starglider ... $18.95
Sentry ... $22.95

Microleague:
Microleag. Baseball ... $22.95
General Manager ... $16.95
Stat Disk ... $13.95
Microleag. Wrestling ... $16.95
'87 Team Disk ... $11.95

Microprose:
Airborne Ranger ... $22.95
F-15 Strike Eagle ... $19.95
Gunship ... $19.95
Kennedy Approach ... $13.95
Silent Service ... $19.95
Solo Flight ... $13.95
Top Gunner ... $13.95
Pirates ... $22.95
Stealth Fighter ... $22.95

COMMODORE

Origin:
Autoduel ... $28.95
Ultima III ... $22.95
Ultima IV ... $33.95
Moebius ... $22.95

Software Simulations:
Pure Stat Baseball ... $22.95
Football ... $17.95
Pure Stat College Basketball ... $22.95

Springboard:
Newsroom ... $29.95
Certificate Maker ... $29.95
Clip Art Vol. #1 ... $17.95
Clip Art Vol. #2 ... $23.95
Clip Art Vol. #3 ... $17.95
Graphics Expander ... $21.95

Strategic Simulations:
Gettysburg ... $33.95
Phantasie II ... $22.95
Phantasie III ... $22.95
Road War 2000 ... $22.95
Wizards Crown ... $22.95
Wargame Constr. ... $16.95
Battlecruiser ... $33.95
Eternal Dagger ... $22.95
Shiloh ... $22.95
Questron II ... $22.95
Phantasie ... $22.95
Sons of Liberty ... $19.95

Sublogic:
Flight Simulator II ... $31.49
Jet Simulator ... $24.95
Night Mission Pinball ... $18.95
Scenery Disk 1-6 ... $12.95
Stealth Mission ... $31.95

Timeworks:
Partner C64 ... $22.95
Partner 128 ... $27.95
Swift Calc 128 ... $27.95
Wordwriter 128 ... $27.95
Wordwriter 3 64 ... $22.95
Silvia Porter Vol. 1-64 ... $CALL

Unison World:
Art Gallery 1 or 2 ... $14.95
Print Master ... $17.95
Art Gallery Fantasy ... $25.95

AMIGA

Access:
World Class Lead. Bd. ... $CALL

Activision:
Champ. Basketball ... $25.95
Championship Golf ... $22.95
GFL Football ... $25.95
Gee Bee Air Rally ... $22.95

Electronic Arts:
Gridiron ... $26.95
Oneon One ... $13.95
Weaver Baseball ... $33.95
Return to Atlantis ... $CALL

Epyx:
Apshai Trilogy ... $11.95
Winter Games ... $22.95
World Games ... $22.95
Destroyer ... $22.95

Firebird:
Guild of Thieves ... $25.95
Pawn ... $25.95
Starglider ... $25.95

Microprose:
Silent Service ... $22.95

Sublogic:
Flight Simulator II ... $31.49
Scenery Disk ... $CALL

Unison World:
Print Master ... $25.95
Art Gallery 1 or 2 ... $14.95
Fonts & Borders ... $17.95
Art Gallery Fantasy ... $25.95

AMIGA

Access:
Wld. Cl. Leader Board ... $27.95
10th Frame ... $27.95

Activision:
Champ. Baseball ... $22.95
Champ. Basketball ... $22.95
Zork Trilogy ... $39.95
Leather Goddesses ... $22.95
Beyond Zork ... $27.95

Broderbund:
Ancient Art of War ... $25.95
Print Shop ... $32.95
Print Shop Compan. ... $31.95
Graphic Lib. I or II ... $19.95
Ancient Art of War at Sea ... $25.95
Carmen San Diego World ... $22.95
Superbike Challenge ... $11.95
Search and Destroy ... $9.95

Electronic Arts:
Weaver Baseball ... $25.95
Starflight ... $32.95
Yeager's AFT ... $26.95

Epyx:
Apshai Trilogy ... $11.95
Create A Calendar ... $15.95
Destroyer ... $22.95
St. Sports Basketball ... $22.95
Sub Battle Simulator ... $22.95
Winter Games ... $11.95
World Games ... $22.95
Rad Warrior ... $13.95
Spy vs. Spy III ... $13.95

Firebird:
Starglider ... $25.95
Guild of Thieves ... $25.95

Microleague:
Microleag. Baseball ... $22.95
General Manager ... $16.95
Stat Disk ... $13.95

Microprose:
Conflict in Vietnam ... $22.95
Crusade in Europe ... $22.95
Decision in Desert ... $22.95
F-15 Strike Eagle ... $22.95
Silent Service ... $22.95
Gunship ... $27.95
Pirates ... $22.95

Origin:
Ultima I ... $22.95
Ultima III ... $22.95
Ultima IV ... $33.95
Moebius ... $33.95
Ogre ... $16.95

Strategic Simulations:
Wizards Crown ... $22.95
Kampfgruppe ... $33.95
Phantasie ... $22.95
Phantasie III ... $22.95
Rings of Zilfin ... $22.95
Shiloh ... $22.95

Sublogic:
Jet Simulator ... $31.49
Flight Simulator ... $34.95

Timeworks:
Swiftcalc ... $39.95
Wordwriter ... $34.95

Unison World:
Art Gallery 2 ... $14.95
News Master ... $49.95
Print Master (+) ... $29.95
Fonts & Borders ... $17.95

IBM

Access:
Wld. Cl. Leader Board ... $27.95
10th Frame ... $27.95

Activision:
Champ. Baseball ... $22.95
Champ. Basketball ... $22.95
Zork Trilogy ... $39.95
Leather Goddesses ... $22.95
Beyond Zork ... $27.95

Broderbund:
Ancient Art of War ... $25.95
Print Shop ... $32.95
Print Shop Compan. ... $31.95
Graphic Lib. I or II ... $19.95
Ancient Art of War at Sea ... $25.95
Carmen San Diego World ... $22.95
Superbike Challenge ... $11.95
Search and Destroy ... $9.95

Electronic Arts:
Weaver Baseball ... $25.95
Starflight ... $32.95
Yeager's AFT ... $26.95

Epyx:
Apshai Trilogy ... $11.95
Create A Calendar ... $15.95
Destroyer ... $22.95
St. Sports Basketball ... $22.95
Sub Battle Simulator ... $22.95
Winter Games ... $11.95
World Games ... $22.95
Rad Warrior ... $13.95
Spy vs. Spy III ... $13.95

Firebird:
Starglider ... $25.95
Guild of Thieves ... $25.95

Microleague:
Microleag. Baseball ... $22.95
General Manager ... $16.95
Stat Disk ... $13.95

Microprose:
Conflict in Vietnam ... $22.95
Crusade in Europe ... $22.95
Decision in Desert ... $22.95
F-15 Strike Eagle ... $22.95
Silent Service ... $22.95
Gunship ... $27.95
Pirates ... $22.95

Origin:
Ultima I ... $22.95
Ultima III ... $22.95
Ultima IV ... $33.95
Moebius ... $33.95
Ogre ... $16.95

Strategic Simulations:
Wizards Crown ... $22.95
Kampfgruppe ... $33.95
Phantasie ... $22.95
Phantasie III ... $22.95
Rings of Zilfin ... $22.95
Shiloh ... $22.95

Sublogic:
Jet Simulator ... $31.49
Flight Simulator ... $34.95

Timeworks:
Swiftcalc ... $39.95
Wordwriter ... $34.95

Unison World:
Art Gallery 2 ... $14.95
News Master ... $49.95
Print Master (+) ... $29.95
Fonts & Borders ... $17.95

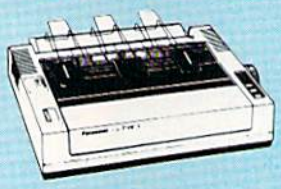
ng on Prepaid cash orders over $ 50 in the Continental U.S.

Price Guarantee

Since 1981, we have led the industry by continuing to offer the lowest national prices while providing quality service. Many companies have come and gone trying to imitate our quality and service. If by some oversight we do not have the lowest prices advertised on the products you desire, then we would appreciate the opportunity to rectify this oversight.

Great Performance Great Price

Panasonic 1080i Model II



- 150 cps Draft Mode
- NLQ Mode
- Friction & Tractor Feed
- 2-Year Warranty

$179.95

Monitors

Thomson:

230 Amber TTL/12"	$79.95
4120 CGA	$219.95
4160 CGA	$254.95
4460 EGA	$349.95
4375 UltraScan	$389.95
GB 200 Super Card	$184.95
4570	$CALL

**Quantities Limited*

Blue Chip:

BCM 12" Green TTL	$64.95
BCM 12" Amber TTL	$69.95

NEC:

Multisync II	$599.95

Save $210 over NEC Multisync with Thomson 4375 UltraScan $389.95

Magnavox:

BM7652	$84.95
BM7622	$84.95
7BM-613	$79.95
7BM-623	$79.95
CM8502	$189.95
CM8505	$209.95
CM8562	$239.95
CM8762	$249.95
8CM-515	$269.95

Modems

Avatex:

1200e	$69.95
1200i PC Card	$69.95
1200hc Modem	$89.95
2400	$179.95
2400i PC Card	$169.95

Hayes:

Smartmodem 300	$149.95
Smartmodem 1200	$285.95
Smartmodem 2400	$425.95

New for '88

Star Micronics Inc NX-1000

- 144 cps Draft
- 36 cps NLQ
- EZ Operation Front Panel Control

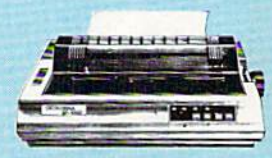
$179.95

NEW! NX1000 Rainbow Color Printer $225.95

Commodore Ready

SEIKOSHA Sp 180VC

- 100 cps Draft
- 20 cps NLQ
- Direct Connect for Commodore



Seikosha price increases possible — please order early.

$129.95

PRINTERS

SEIKOSHA

SP 180Ai	$129.95
SP 180VC	$129.95
SP 1000VC	$139.95
SP 1000AP	$169.95
SP 1200VC	$155.95
SP 1200Ai	$165.95
SP 1200AS RS232	$165.95
SL 80Ai	$299.95
MP1300Ai	$269.95
MP5300Ai	$399.95
MP5420FA	$995.95
SP Series Ribbon	$7.95
SK3000 Ai	$339.95
SK3005 Ai	$419.95
SPB 10	$CALL
SL 130Ai	$599.95

Toshiba

321SL	$489.95
341 SL	$659.95
P351 Model II	$899.95
351 SX 400 cps	$1019.95

Star Micronics Inc

NX-1000	$179.95
NX-1000C	$179.95
NX-1000 Color	$225.95
NX-1000C Color	$229.95
NX-15	$309.95
NR-10	$339.95
NR-15	$439.95
NB-15 24 Pin	$699.95
NB24-10 24 Pin	$425.95
NB24-15 24 Pin	$579.95
Laser 8	$CALL

CITIZEN

120 D	$149.95
180 D	$169.95
MSP-10	$259.95
MSP-40	$289.95
MSP-15	$324.95
MSP-50	$389.95
MSP-45	$425.95
MSP-55	$489.95
Premiere 35	$464.95
Tribute 224	$624.95
Tribute 124	$469.95

EPSON

LX800	$179.95
FX86E	$279.95
FX286E	$424.95
EX800	$399.95
LQ500	$309.95
LQ1000 w/Tractor	$549.95
LQ2500	$819.95
GQ3500	$LOW
LQ850	$489.95
LQ1050	$659.95

OKIDATA

Okimate 20	$119
Okimate 20 w/cart	$179.95
120	$189.95
180	$219.95
182	$209.95
182+	$225.95
183	$249.95
192+	$309.95
193+	$449.95
292 w/interface	$449.95
293 w/interface	$585.95
294 w/interface	$819.95
393	$955.95

Panasonic

1080i Model II	$179.95
1091i Model II	$199.95
1092i	$319.95
1592	$409.95
1595	$459.95
3131	$299.95
3151	$479.95
KXP 4450 Laser	$CALL
1524 24 Pin	$559.95
Fax Partner	$589.95

DIABLO

D25	$499.95
635	$779.95

BROTHER

M1109	$195.95
M1409	$299.95
M1509	$335.95
M1709	$475.95
Twinwriter 6 Dot & Daisy	$899.95
M1724L	$599.95
HR20	$339.95
HR40	$569.95
HR60	$709.95

Join the thousands who shop Lyco and Save

We stock interfacing for Atari, Commodore, Apple and IBM.

Pointer

Charles Prince

This clever utility allows you to use a joystick-controlled, mouse-like pointer in your own BASIC programs. A demo is included to help you get the most from this program. For the 64 with joystick.

"Pointer" is a short machine language utility that displays an on-screen arrow you can maneuver around your 64's display with a joystick. With Pointer installed, you can program your joystick to create "point-and-shoot" applications like those used in the popular *GEOS* operating system. "Finder," Program 2, demonstrates how to locate the arrow's position on the screen so you can use Pointer to its best advantage.

Pointer is written in machine language, so you'll need to enter it with "MLX," the machine language entry program found elsewhere in this issue. When you run MLX, you'll be asked for the starting and ending addresses of the data you'll be entering. Here are the values to use for Pointer:

Starting address: CF00
Ending address: CFF7

Follow the MLX instructions carefully and be sure to save a copy of the Pointer data before you leave MLX.

Using Pointer in Your Own Programs

There are two ways to use Pointer in a program. First, you can wait for the fire button to be pushed. This can be done in two ways:

```
100 WAIT 56320,16,16
```

or

```
100 IF (PEEK(56320)AND16)=16 THEN
    100
```

Both options will freeze execution of the BASIC program until the fire button is pressed. The program then continues normally.

The second method involves reading the location of the pointer. This is accomplished with three simple formulas:

```
X=INT(((PEEK(53262)-255*(PEEK(53264)
  =128))-24)/8)
Y=INT((PEEK(53263)-49)/8)
SL=40*Y+X
```

In these formulas, *X* is the column where the pointer is currently located (in the range 0–39), *Y* is its row (in the range 0–24), and *SL* is the specific cell of the screen that the pointer occupies (between 0 at the top left corner and 999 at the lower right).

Once these steps have been taken, your BASIC program can do whatever is required when the user has pointed at something and pressed the fire button. For example, the joystick could be used to pick options from a menu on the screen. In this case, one space on the screen should be designated as the *activating space* for each option. When the user points to this space, the BASIC program transfers control to the appropriate subroutine to execute the chosen option.

(A Macintosh-style interface can be created by combining Pointer with "Looking Glass," a program published in *COMPUTE!*'s June 1986 issue that adds windowing capabilities to the Commodore 64. When the two programs are used in concert, your BASIC programs take on a whole new look, with windows and pull-down menus. Pointer was written to be completely compatible with Looking Glass.)

Customizing Pointer

There are several ways to customize Pointer for your preferences. You can change the color of the pointer simply by typing

```
POKE 53294,n
```

where *n* is the number of the desired color. Values for colors are the following:

0 = Black	8 = Orange
1 = White	9 = Brown
2 = Red	10 = Light Red
3 = Cyan	11 = Dark Gray
4 = Purple	12 = Medium Gray
5 = Green	13 = Light Green
6 = Blue	14 = Light Blue
7 = Yellow	15 = Light Gray

To change what the pointer looks like, you can use any sprite. (Please note, however, that sprites that are eight pixels by eight pixels or smaller work best. If you use anything larger, you won't be able to select anything in the bottommost row or the rightmost column.) Either you can place the data for the new sprite in locations 704–766—erasing the data for the original sprite—or you can store the data for the new sprite somewhere else (such as the cassette buffer) and change the data pointer by entering POKE 2047,*b*, where *b* is the number of the block in which you stored the data.

If the picture for the new sprite has a size other than four pixels by four pixels, you'll need to change two registers in the routine with the following POKES:

```
POKE 53101,251-YW
POKE 53146,88-XW
```

YW is the height of the sprite, and *XW* is its width (both measured in pixels). For example, for a sprite with a width of six pixels and a height of eight pixels, you'd enter:

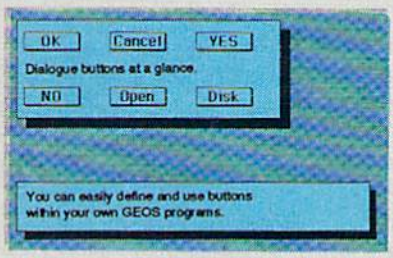
```
POKE 53101,243
POKE 53146,82
```

We're giving away $25,000 in prizes

In our GEOS application contest

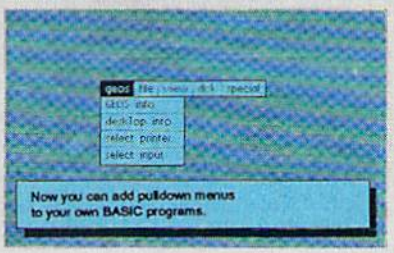
List of prizes

Grand Prize	$1000 CASH (1 winner)
2nd Prize	Choice of Abacus books and software (2 awards) $500 value
3rd Prize	Choice of Abacus books and software (2 awards) $400 value
4th Prize	Choice of Abacus books and software (2 awards) $300 value
5th Prize	Our complete C-64 Library Set-$227 value (100 awards)



BeckerBASIC gives you over 270 commands

Create Hi-res drawings on the GEOS screen



Pulldown Menu Construction Set

Abacus

Dept. M3 • 5370 52nd Street SE
Grand Rapids, MI 49508
Telex 709-101• FAX 616/698-0325
Phone 616/698-0330

You already know GEOS. And if you know BASIC, then you can write applications to run under GEOS using our new and exciting BeckerBASIC for the C-64.

Now Abacus is sponsoring a contest to find the most talented authors among you. We're looking for the best GEOS applications written using our powerful BeckerBASIC. With more than 270+ new commands and functions, BeckerBASIC makes writing GEOS applications a snap. There's commands for hires graphics, pulldown menus, dialog boxes and much more.

To learn more about BeckerBASIC or our contest write or call Abacus. Or better yet, pick up a copy of BeckerBASIC at one of our thousands of dealers and start writing those GEOS applications now.

Here's the contest rules:

1. Write your entries using BeckerBASIC to run under GEOS. Entries must be submitted on a diskette.
2. You can submit multiple entries provided that all entries fit on a single diskette.
3. Entries must be accompanied by the official entry form you'll find inside the BeckerBASIC package. Xerox or reproductions of the entry form are not acceptable.
4. You must make sure that your entry is received by Abacus no later than August 31, 1988.
5. We'll announce the winning entries by October 31, 1988.

Complete rules are on the official entry form inside the BeckerBASIC package.

___ YES! I want to start writing applications for GEOS. Please rush me BeckerBASIC at $49.95 plus $4.00 shipping and handling (foreign $12.00). Michigan residents add 4% sales tax.

Payment: VISA MC AMEX Check MoneyOrder

Card No._____ Exp. date _____

___ YES! I'm intestesting in writing GEOS applications. Please send me information about BeckerBASIC and your contest.

Name _____

Address _____

City _____ State ___ Zip _____

___ Please send me a free catalog of your extensive line of software and books for the Commodore 64 or Commodore 128.

To order, mail this coupon or call **1-800-451-4319** Abacus, 5370 52nd Street SE, Grand Rapids, MI 49508

Finder

Finder, Program 2, is designed to demonstrate how to use Pointer and to help you determine where things are on the screen. Since Finder is written entirely in BASIC, simply type it in, save a copy to disk, and type RUN.

You'll see the pointer on the screen and, in the upper left corner, the *x* and *y* coordinates followed by the screen position. To find the position of a point on the screen, use the joystick to move to any location, press the space bar to erase the position information, and press the fire button on the joystick. Pressing Q at any time will return you to BASIC.

Program Notes

When using Pointer, there are a few restrictions to note:

- Your BASIC program cannot use sprite number 7, since that is the one used by the machine language routine for the pointer.
- The BASIC program cannot store anything in locations 704–766, except to change the appearance of the pointer.
- Anything that is stored in locations 52992–53232 will affect the machine language routine already there and probably result in a crash.
- If your BASIC program uses WAIT 56320,16,16 to test for the fire button, you won't be able to use the RUN/STOP key during that wait.

Pointer works by wedging itself into the computer's hardware interrupt. The hardware interrupt is that part of the operating system that performs various housekeeping functions 60 times per second. By changing the interrupt vector (locations 788–789) to point at the new routine, the computer reads the joystick and moves the pointer accordingly every 1/60 second, regardless of what else is going on. This gives BASIC programmers more memory to work with, since they no longer need to include routines in their programs to read the joystick, check to see if the sprite has gone off the screen, and so on. Pointer, running in the background, takes care of all these details.

See program listings on page 74.

Graphics Wedge

Phillip A. Gilley

View any hi-res picture on your screen with this powerful machine language graphics utility for the Commodore 64. Six different formats are supported.

One of the most impressive features of the Commodore 64 is its bit-mapped graphics. Beautiful pictures can be created with a variety of graphics programs, including *DOODLE!*, *KoalaPainter*, and *Cadpak*.

Unfortunately, it can be difficult to display the pictures you've made. To display a picture file created with *KoalaPainter*, for instance, you must load and run the *KoalaPainter* program and then load the picture. From within *KoalaPainter*, you can load only *KoalaPainter* pictures. To load a picture of another format, you must leave *KoalaPainter* and run the appropriate program. "Graphics Wedge" is the solution to this problem.

Graphics Wedge is a short machine language program that allows you to view picture files quickly and easily—even pictures created by different graphics programs. Graphics Wedge can display files created with *Blazing Paddles*, *Cadpak*, *DOODLE!*, *KoalaPainter*, *Micro Illustrator*, and the Screen Magik area of *The Print Shop*—the only time you'll need to load a graphics program is when you draw your pictures.

Graphics Wedge is especially handy for those who have many public domain pictures, but don't have the graphics programs needed to display them.

Getting Started

Since Graphics Wedge is written in machine language, you'll need to enter it with the "MLX" machine language entry program found elsewhere in this issue. When you run MLX, you'll be asked for the starting and ending addresses of the data you'll be entering. For Graphics Wedge, use the following values:

Starting address: 0801
Ending address: 0B28

Follow the MLX instructions carefully, and be sure to save a copy of the Graphics Wedge data before you leave MLX.

Easy Display

To use Graphics Wedge, load and run it just like a BASIC program. Graphics Wedge places itself in a safe area of memory and returns you to the READY prompt.

Viewing picture files is easy. First, type LOAD "*filename*",8,1 (tape users should type LOAD "*filename*",1,1). The picture loads into memory. Now type a period and press RETURN. You'll see a list of the file formats that Graphics Wedge supports. Press the letter that corresponds to the format of the picture. The picture will appear on the screen.

While the picture is being displayed, you can change the border and background color. The f1 and f2 keys cycle through the border colors (f1 cycles forward; f2 cycles backward). The f3 and f4 keys cycle through the background colors. (Note: Changing the background color while in multicolor mode can produce strange results.) When you are finished viewing the picture, press a key.

You can now load and display another file. If you're not sure what format a picture is in, try one. If it fails, load the picture again and try another format.

See program listing on page 77.

PRICE & QUALITY

YOU CAN DEMAND IT FROM OTHERS— BUT YOU CAN *EXPECT* IT FROM APROTEK

The Great Communicator

THE DIRECT-CONNECT HAYES® AND COMMODORE® 1670 COMPATIBLE 1200 BAUD MODEM FOR ONLY $89.95

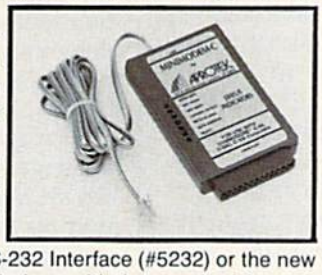
Everything from Electronic Mail (E-mail) to stock quotes and huge databases of every imaginable type is now on line to the small computer owner. You can even send and receive messages anywhere in the world. All you need is a telephone and a modem which allows your computer to communicate with others.

Almost all modems (and services) are set up to communicate in one of three speeds; 300, 1200 and 2400 Baud. Most computer users prefer 1200 Baud. (1200 Baud is about 4 times as fast as 300 which means you spend about ¼ the time and money getting the data you want and more time enjoying it.)

2400's are great (and quite expensive), only if you have a dedicated, data-grade phone line. Here's why. The regular phone system usually doesn't have the signal clarity and bandwidth to support more than about 1200 baud and as a result, 2400 Baud modems run at either 1200 or, on a real bad line, 300 Baud. They adapt to the worst-case line conditions and will slow transmission accordingly. Why buy a 2400 Baud modem for a lot more money when it's going to transmit at 1200 Baud much of the time anyway?

You will also notice a few very cheap 1200s on the market at "too good to be true prices." They are. The reason is that they are not truly Hayes and/or Commodore 1670 compatible therefore not usable in all situations and with all serivces. The Aprotek Minimodem-C™ is both Hayes and Commodore 1670 compatible and 300/1200 baud. Why not get a modem that will satisfy your present AND future needs by going directly to an inexpensive Aprotek Minimodem-C™ especially when we have it on sale?

What do you get for $89.95? Everything! You don't need to worry about cables, compatibility or anything else! We don't just sell hardware, we sell solutions. The Aprotek Minimodem-C™ plugs directly into your Commodore C-64, C-64C or C-128 USER port. It is unique in that it has two separate (switchable) emulation modes (Hayes and Commodore 1670) to make it compatible with ALL available software. The Aprotek Minimodem-C™ is a full feature, 1200 Baud modem with Auto Answer, Auto Dial, Touch-Tone or rotary dialing, has the full complement of status indicators on the top panel and has a built-in speaker. Just plug it into your computer and standard phone jack with the attached cable. Minimodem™ is supplied with "Multiterm" 64 and 128.



Also included is a free trial offer subscription to Compuserve, a very useful user database with local access numbers and about every feature imaginable.

Do you have more than one computer or do you plan to get another computer? You can "have your cake and eat it too." Simply order our Universal RS-232 Interface (#5232) or the new Com-Modem™ adapter (#5100) along with the standard Aprotek Minimodem-H™ which you can use with any computer that has a RS-232 serial port as well as with your Commodore. The Universal RS-232 interface can also be used to connect your Commodore to any other RS-232 device. Aprotek Minimodem-C™ is tiny. Only 4¾" long, 2¾" wide and ¾" high. The smallest yet best featured modem on the market. Order yours today!

NO RISK POLICY

Try any Aprotek product for two weeks. If you are not satisfied, send it back for a prompt refund.

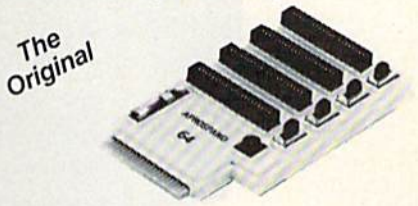
NOW FOR THE BEST PART, THE PRICE!

Order #	Item	Qty	Price	Shipping	Total
6212	MINIMODEM-C (Commodore)	___	89.95	_____	_____
6214	MINIMODEM-H (RS-232)	___	99.95	_____	_____
6216	MINIMODEM-AM (Amiga)	___	99.95	_____	_____
_____	(Specify)				

Modem shipping—Cont. US $6.00, UPS Blue, CAN, AK, HI, APO $10.00

Aprospand-64™

Gives your Commodore 64 or 128 full expandability! This superbly designed expansion module plugs into the expansion port and gives you four switchable (singly or in any combination) expansion connectors—plus fuse protection—plus a reset button! Before you buy an expander, be sure that it has a fuse to protect your computer and that you can activate your cartridges in **any** combination allowed by the cartridges.



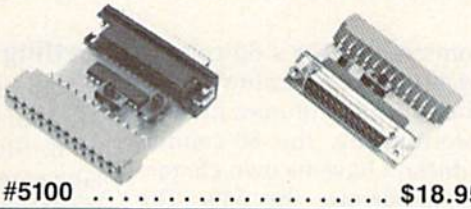
ONLY $29.95 + S&H **Order #5064**

UNIVERSAL RS-232 INTERFACE

with Commodore USER Port expansion. ONLY $39.95 + S&H

Now you can connect and communicate with any of the popular RS-232 peripherals using your Commodore **USER** Port. This superb expander opens a whole new world to your Commodore computer's capabilities. You can now connect to printers, modems and any other RS-232 device. If you already have something that connects to the USER Port, don't worry because the port is duplicated on the outside edge of the interface. Simply plug it in and turn on the device you want to communicate with. Comes complete with sample driver program listings. Compatible with all Commodore home computers with a USER port. 1-year warranty. **Order #5232.**

NEW! "COM-MODEM" ADAPTER — Use any Hayes® compatible modem with DB-25 connector through your USER port. You can make it emulate a 1670 too, or turn it off entirely. Can be used with our other USER port equipment such as "USER EXTENDER" (#5250) or "UNIVERSAL RS-232 INTERFACE" (#5232).



Order #5100 ..... $18.95 + S&H

"EXTENDER-64"—10" Ribbon cable extender for your Commodore CARTRIDGE port. Used with Aprospand-64. **Order #5065 . . . $19.95 + S&H**

"USER EXTENDER"—10" Ribbon cable extender for your Commodore USER port. **Order #5250 ..... $21.95 + S&H**

Com 6 Pin Serial Cable (5ft) #3006-5MM **$7.95,** (8ft) #3006-8MM **$9.95**
Commodore Serial Ext. (5ft) #3006-5MF **$7.95,** (8ft) #3006-8MF **. . $9.95**

Shipping per each above item: Cont. US = $3. Can, PR, HI, AK, APO, UPS Blue = $6

ORDER INFORMATION California residents add 6% tax. All prices are cash prices—VISA and MC add 3% to total. We ship the next business day on money orders, cashier's checks, and charge cards. A 14-day clearing period is required for checks. Prices and availability subject to change—CALL. **Available at Selected Dealers.** Dealer inquiries invited. **2 week satisfaction or your money back trial period on all products.**

For information call **805/987-2454 (8–5 PST)**

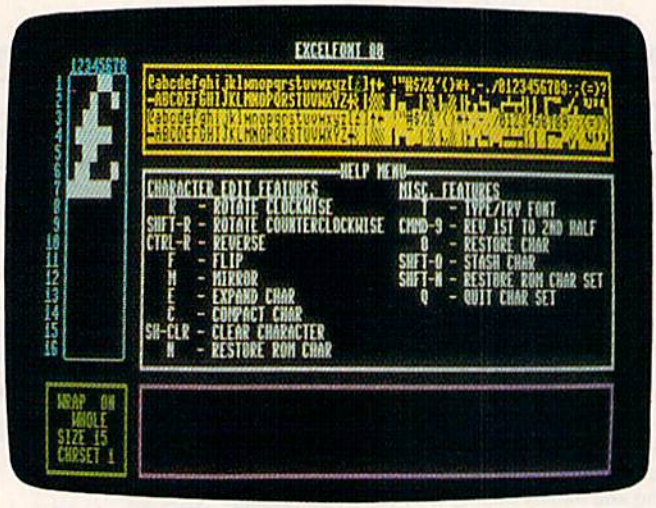
TO ORDER CALL TOLL FREE

800-962-5800 - USA, 800-962-3800 - CA (7–6 PST)

Or send order to:

APROTEK

Dept. CG
1071-A Avenida Acaso
Camarillo, CA 93010



Editing characters is easy with this powerful, feature-packed program.

Excelfont 80

Super Character Editor for the 128

Daihung Do

With this well-designed and powerful utility, you can easily create your own custom 80-column character sets for the 128, using an amazing maximum of 15 pixel rows for each character. An 80-column monitor and disk drive are required.

The Commodore 128's 80-column video is a remarkable improvement over the 64's 40-column display, but unfortunately, the 80-column screen doesn't have its own character set—it borrows the 64's. The 64's characters, though fine in 40 columns, don't do justice to the 128's 80-column resolution. "Excelfont 80" solves this problem by allowing you to creatively design any number of attractive character sets to suit your preferences.

One special feature of Excelfont 80 is that it allows you to edit the full 15 rows of the 80-column set. Imagine a large 15-row character set for titling and a smaller one for normal text. With Excelfont 80, you can create just the right look for any program on which you're working. Although Excelfont 80 is partially written in machine language, you don't need to know machine language in order to use it.

Getting Started

Excelfont consists of six programs. Three of these programs are written in BASIC, and three in machine language. Program 1, EXCEL.LDR, loads the other programs into memory and sets up the screen. Since Program 1 is written in BASIC, simply type it in and save a copy to disk with the name EXCEL.LDR.

Program 2 does most of the work, scanning the keyboard and calling the correct machine language routines. Program 2 is written in BASIC, so type it in and save a copy to disk with the filename EXCEL .BAS.

Program 3 is the main machine language program, the one that actually manipulates characters and accesses the 80-column video chip. Enter this program with "128 MLX," the machine language entry program found elsewhere in this issue. When you run 128 MLX, you'll be asked for the starting and ending addresses of the data you're entering. For Program 3, use the following:

Starting address: 0C00
Ending address: 0FCF

When you've finished entering the Program 3 data, save it with the filename EXCEL.OBJ. Be sure to use this name, because Program 1 looks for a file with this name on disk.

Program 4 is also a machine language program, so again, use 128 MLX to enter it. Respond to the prompts with the values indicated:

Starting address: 1300
Ending address: 135F

When you've finished entering the Program 4 data, save it with the filename EXCEL.OBJ1. It's important that you use the name EXCEL .OBJ1, because this is the filename that Program 1 uses to load this file.

Program 5 is a BASIC program that merges the two character sets into one. Simply type it in and save a copy to disk with the filename EXCEL.UTL.

Program 6 is a machine language program that enables you to

load and install a character set for use in your own programs. Use 128 MLX to type in this program. When you run 128 MLX, you'll be asked for the beginning and ending addresses of the data you're entering. The values for Program 6 are as follows:

Starting address: 0C00
Ending address: 0C2F

When you've finished entering the data, be sure to save a copy with the filename EXCEL.OBJ2. Be sure to save the data with this filename because this is the name Program 5 will expect.

Up and Running

In order for Excelfont 80 to work, all six files must be on the same disk in the disk drive, and your 128 must be in 80-column mode. When everything is set, type

```
RUN"EXCEL.LDR"
```

followed by RETURN, to run the program.

This program loads the other three programs into memory and executes Program 2, EXCEL.BAS. (The last two programs, Programs 5 and 6, are used separately.) On the main screen you'll see a character-editing window with an enlarged version of the character currently being edited, a window that displays the entire character set, a help window, a status window, and a prompt window.

When you first start the program, you'll be asked whether you want to edit the uppercase/graphics (character set 0) or the lower-/uppercase character set (character set 1). Excelfont 80 allows you to edit one character set at a time. Later, the two separate character sets can be merged into one. The second prompt asks for the number of character rows you'll be using for the character. This question affects the number of rows that are reversed, mirrored, or flipped when the appropriate options—to be discussed later—are selected.

You'll notice that there are two cursors on the screen: One is in the character-editing window, and the other one is in the character-selecting window. To move the cursor in the character-editing window, use a joystick in port 2. To move the cursor in the character-selecting window, use the cursor keys. When you press the fire button, the corresponding pixel under the cursor is set or cleared, depending on its previous state: If it was set, then it will be cleared, and vice versa. To continuously set or clear pixels, hold down the fire button and move the cursor around. You'll notice that the corresponding character in the character-selecting window is altered with each change you make to the expanded character in the character-editing window. When you move the character-selecting cursor, the pattern in the character-editing window changes to the character that is under the cursor in the selecting window.

Editing Characters

Excelfont has several features that allow you to edit and manipulate the character in the editing window or even the whole character set. Here's a brief description of each one.

HELP. Pressing this key displays a Help menu in the Help window. Press HELP again to see the next Help menu. There are a total of three of them, so pressing HELP three times returns you to the first menu.

R. Rotates your character clockwise. This feature only rotates the upper 8 × 8 grid. It will operate regardless of the number of character rows. This feature is handy if, for example, you want to make a ship point in a different direction, or if you want to create a sideways character set. If you want to rotate the bottom 8 × 8 grid, just scroll the character eight times vertically to move the bottom eight rows to the top, rotate the character, and then scroll it back so that the character is back where it started, except for the rotated bottom rows.

SHIFT-R. This command is like R, but it rotates your character counterclockwise instead of clockwise.

CONTROL-9. Reverses the character. All pixels that have been set are cleared and all cleared pixels are set. If you press this twice, you'll have the same character you started with.

F. Flips the character vertically. This is the same as pressing R twice, but it saves a keystroke.

M. This command mirrors your character horizontally. This feature allows you to make mirrored character sets. Pressing this key twice returns to the character with which you started.

SHIFT-CLEAR/HOME. Clears the character so you can begin afresh. Be careful with this option, however; you may have to edit the whole character over if you press this accidentally.

N. Restores the ROM character image. If you've made a mistake trying to enhance a ROM character, press this to get it back. Please note that this restores the ROM character, not your previous character.

E. Pressing this key enlarges (or expands) the character vertically. This feature is particularly useful if you're making a 15-row character set. It makes two rows for every one row that was in the original pattern. Be careful not to press this twice, because it will ruin your character, leaving you no way to get it back. This feature destroys the last eight rows of the original character.

C. This command is the opposite of E, above. It shrinks the character. If you press E and then this key, you'll have your original character pattern.

Commodore-9. Copies the first two rows, reverses them, and then writes them to the bottom two rows, effectively making a reverse character set for your new character set. This feature can be quite a timesaver.

T. Use this command to try your new character set. If you specified any number of character rows except 8 or 16, you'll be prompted to enter the number of displayed character rows, 8 or 16. You're asked this because Excelfont can only display either an 8- or a 16-row character set. After you've answered the prompt, the main screen is replaced by a nearly blank one. You can type and try out your font as much as you wish. Press the ALT key to return to the main screen.

O. Stashes your character in a buffer so you can recall it later. If you're about to make a big change in your character, stash it here first in case you make a mistake.

SHIFT-O. Recalls the character from the buffer. If you press this key before you've saved something to the buffer with the above feature, you'll get a random pattern.

SHIFT-N. Restores the ROM character set. Please note that this will erase your whole character set, replacing it with the one in ROM.

You'll be asked if you really want to do this before the ROM character set is restored.

Q. Allows you to quit the character set and edit another one.

HOME. Homes the editing cursor to the top of the character-editing window.

Cursor keys. Allow you to move the character-selecting cursor.

Joystick (in port 2). Allows you to move the editing cursor.

Joystick fire button. Sets or clears pixels in the editing window.

Y. Scrolls up in the cursor's column.

G. Scrolls left in the cursor's column.

H. Scrolls right in the cursor's column.

B. Scrolls down in the cursor's column.

8. Scrolls the whole character up.

4. Scrolls the whole character left.

6. Scrolls the whole character right.

2. Scrolls the whole character down. Scrolling affects the entire column or row. The number of rows it affects will always be either 8 or 16.

D. Displays the disk directory.

S. Saves the character set. Note that the character set is saved with a starting address of 8192 and an ending address of 12288. You can merge character sets after they have been saved by using EXCEL.UTL, Program 5.

L. Loads a saved character set. The loaded character set must have been created and saved from Excelfont in order for it to load correctly. When you load a character set, the one that was in memory will be replaced by the new one, so save the old one if you'll need it later. If you attempt to load a character set created with another character editor, the results are unpredictable.

@. Allows you to enter a DOS command through the command channel. See your disk drive manual for more information. It's possible to scratch and rename files, and format, initialize, and validate disks with this option.

W. This command toggles wrapping on the scrolling features.

P. Toggles between whole and part rows. If you're in whole mode, mirroring, reversing, or flipping affects the character up to the row that you entered as the maximum number of displayed character rows (specified when you first ran the program). If you're in part mode, the mirroring, reversing, and flipping only affect the rows from the top of the character to the row that the cursor is on.

Program Notes

Excelfont's machine language routines do most of the program's work, such as manipulating characters, accessing the 80-column video chip, and moving memory. The BASIC program is essentially a shell. It reads the keyboard, calls the appropriate routines, prints the screen, loads and saves files, and performs screen tricks with the help of the ML program.

You may be interested in the way the program manages to make the screen fade in and fade out. This effect is created by decrementing (to fade out) or incrementing (to fade in) VDC registers 22 and 23. To change a register, use the following command in bank 15:

```
SYS 52684,value,registernumber
```

Register 22 controls a character's horizontal size. Bits 0–3 control how many horizontal pixels of a character are displayed. This affects all the characters on the screen, so by decrementing this value slowly, you can make the screen fade out. By incrementing the register after you've changed the screen, you create a fade-in effect.

Register 23 controls the character's vertical size. The fading effect that you want determines which register to change. If you want characters to slowly disappear by losing columns, use register 22. If you want them to fade in or out vertically, use register 23.

The curtain effects are created by incrementing or decrementing register 34 or 35. Register 34 controls the left-most blanked column; register 35, the right-most blanked column. The left-most visible column on many monitors is 0, and the right-most column is 96. You may have noticed that there are three different curtain effects you can create. A curtain can move from the left side of the screen to the right, or vice versa; or a curtain can come in from both sides to meet in the center. You don't have to use a curtain effect; you can blank out the screen while you're setting up another one so that it will pop into view. Note that when you blank a screen or column, it turns black because the electron gun in your monitor is turned off.

Installing a Character Set

To use a character set in your program, you need Programs 5 and 6, EXCEL.UTL and EXCEL.OBJ2, respectively.

If you plan to use just one character set, decide which one—that is, either uppercase/graphics or lowercase/uppercase. If you want the leftover character set to be the default ROM character set, boot up Excelfont and select which ROM character set you want to use and save it to disk. Then follow the instructions below as if you were using two character sets. If you want to use only one, saving disk space and loading time, have your program allocate graphics memory, because that's where the character set will be temporarily stored. Then BLOAD the character set into memory at address 8192. After this, BLOAD Program 6 into memory and SYS 3072. Your character set is installed. You can automate this process by adding the following line to the beginning of your program:

```
10 BLOAD"EXCEL.OBJ2":GRAPHICS
   1,1:BLOAD "YOUR CHARACTER
   SET FILENAME":SYS 3072:
   GRAPHICS CLR
```

If you plan to use two character sets, merge them with Program 5; then use the BASIC line above at the beginning of your program to install the character set. Please note, if you reset the computer, or press RUN/STOP–RESTORE, the character set will be erased. If you want the default ROM character set back, just SYS 65378, but be sure that you're in BANK 15.

Excelfont allows you to utilize as many as 15 rows for each character set. To use these large characters in your program, incorporate the following line in your program:

```
100 WR=52684:BANK 15:FAST:SYS
    WR,15,4:SYS WR,6,5:SYS WR,12,6:
    SYS WR,15,7:SYS WR,15,9:SYS
    WR,16,23:WINDOW 0,0,79,12
```

See program listings on page 72.

Eight Thousand Dragons

Paul Carlson

Fractal graphics invade your home with this short but stunning graphics program. "Eight Thousand Dragons" is the fastest fractal program you can find for your Commodore 64.

In the last few years, the word *fractal* has nearly become a household word with personal computer users. A fractal is a curve or surface which has a fractional dimension. While fractals are very important to mathematicians, most people appreciate fractals because of the spectacular graphic effects they make possible. For instance, the *Star Trek II* "Genesis" sequence was fractal-generated.

"Eight Thousand Dragons" lets you view fractal "dragons," one by one, on your 64's hi-res screen. More than eight thousand dragons are possible.

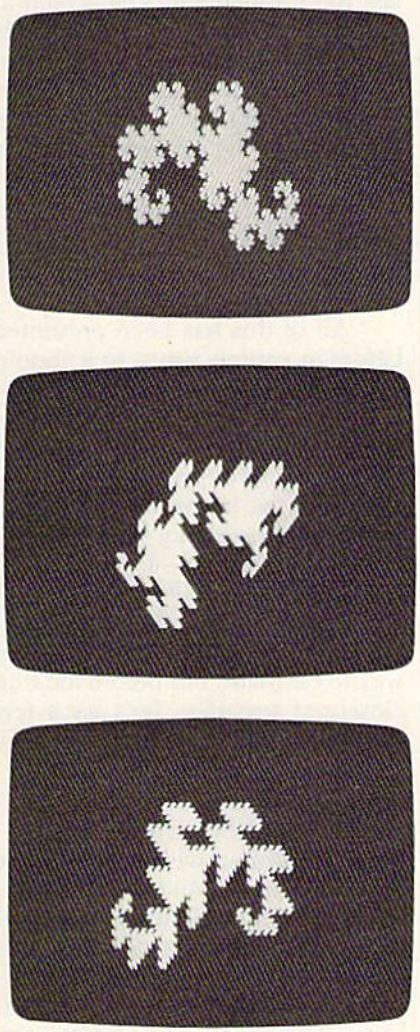
Typing It In

Eight Thousand Dragons is a very short program—just over 400 bytes, in fact. Since it's written in machine language, type it in with "MLX," the machine language entry program found elsewhere in this issue. When MLX asks you for a starting and ending address, respond with the values indicated:

Starting address: 0801
Ending address: 0998

Enter the data for Eight Thousand Dragons. When you've finished, be sure to save a copy to tape or disk.

Although Eight Thousand Dragons is written entirely in machine language for speed (each dragon is drawn in less than 10 seconds), the program loads and runs just like a BASIC program. To start the program, type LOAD "DRAGONS",8 (for disk) or LOAD"DRAGONS",1 (for tape). Use the filename you specified when you saved the program from within MLX. After the program has loaded, type RUN.



Three examples of the beautiful fractals that are automatically created by "Eight Thousand Dragons."

The first fractal you'll see is the classic fractal dragon. Press a key to see the next dragon. After the first, the parameters for the dragons are generated randomly, and more than eight thousand different screens are possible. Press Q at any time to quit.

The Fire-Breathing Engine

To achieve the speed of Eight Thousand Dragons, I used a technique I call *incremental bitmap addressing.* The complete calculation for the bitmap address is done only for the first point plotted. For successive plots, only the change in bitmap address is computed. This is a fast and easy calculation with dragon curves because each point is immediately adjacent to the previous one.

The program is also self-modifying, which means that it changes itself as it runs.

As listed, the program plots orange dragons on a black background. If you'd like different colors, load the program, then type the following lines:

```
POKE 2442,background color number
POKE 2443,foreground color number
RUN
```

The color numbers correspond to those listed in the user's guide that came with your 64.

See program listing on page 72.

My Dear Aunt Sally

Larry Cotton

Over the last couple of months we've written a four-function math program to see how RND works. In the process, I hope you've also discovered more about the BASIC language itself.

In order to concentrate on RND, I deliberately glossed over the math programming. This month, we'll take a closer look at computer math.

The Old Days

In the mid-seventies, I bought an exciting machine—a calculator the size of two videocassettes which could instantly do calculations that machines a year earlier had taken several noisy minutes to do. It was made by APF (who, incidentally, later made an early personal computer called The Imagination Machine). This $80 wonder could do only four things—add, subtract, multiply, and divide.

For several years, calculators that did more than that cost as much as a Commodore 64 does now. Things have changed; we now have wonderful computing machines which can do complex mathematical equations in less time than in takes to press and release a key.

All BASIC math operations, simple or complex, can be accomplished in both BASIC modes—immediate and program. In the immediate mode, the computer works just a like a calculator except that we must type the word *PRINT* (or use a question mark) before the expression and press the RETURN key after it. Here's an example:

```
? 4 + 5
```

If you type this and press RETURN, you'll see the number 9 displayed. This also works with the other three simple math functions:

```
PRINT 18 - 9
PRINT 3 * 3
PRINT 18 / 2
```

The asterisk means multiply and the slash means divide. The answer to all these problems, is, of course, 9. Here are the same problems in program mode:

```
10 PRINT 4+5
20 PRINT 18-9
30 PRINT 3*3
40 PRINT 18/2
```

If you enter this and run it, you'll see four 9's. The computer performs its calculations and prints only the answers—not the problems.

But suppose you did want to see the problems on the screen as well as the answers. The way to do this is simple: Put the problems (along with the equals sign) inside quotation marks. The computer prints whatever's inside quotation marks.

```
10 PRINT "4 + 5 =" 4+5
20 PRINT "18 - 9 =" 18-9
30 PRINT "3 * 3 =" 3*3
40 PRINT "18 / 2 =" 18/2
```

All of this has been presented before in various ways, so it should look familiar. Another (and probably the most common) way to perform math functions is to use letters (variables) to represent numbers. Again, in the immediate mode:

```
A=4: B=5: PRINT A+B
A=18: B=9: PRINT A-B
A=3: B=3: PRINT A*B
A=18: B=2: PRINT A/B
```

Using variables is a powerful way to do math, but before looking closely at variables, let's try a few more examples which use only numbers.

Adding and Subtracting

Math performed with computers is the same math done with calculators, or, for that matter, with pencil and paper. Certain conventions have been adopted which are universal. For instance, in most problems, the math operations are performed from left to right. What would you expect the answer to this problem to be?

```
PRINT 10-5+4
```

The answer is 9. And 9 also would be the answer if the numbers were rearranged:

```
PRINT 4-5+10
```

Adding and subtracting are *commutative*, that is, they can be done in any order. Just be sure that the signs stay with the numbers. To illustrate further:

```
PRINT -5+4+10
```

Again, the answer is 9. The negative sign stays with the 5.

Multiplying and Dividing

Multiplication and division are trickier. In problems which contain only these two operations, the computer will again do the math from left to right. Since this is so, these two lines will *not* produce the same answer:

```
PRINT 12/6*3
PRINT 6/12*3
```

In the first line, the computer first divides the 12 by 6 to get 2, and then it multiplies the 2 by 3 to get 6. In the second line the computer first divides the 6 by 12 (.5) and then multiplies that by 3 to yield 1.5. Division is *not* commutative.

My Dear Aunt Sally

When math problems include combinations of adding, subtracting, multiplying, and division, we mustn't forget *My Dear Aunt Sally*—a memory aid which uses the first letters of the words in the phrase—*MDAS*—to help you remember to Multiply, Divide, Add, Subtract—in that order.

Since the internals of the computer are already preprogrammed to think that way, it's up to the programmer to remember that. Here's a problem which demonstrates how My Dear Aunt Sally goes about her work:

```
PRINT 5+3*6-2
```

Before you type this, try to guess what the answer would be. Now

type the line in and press RETURN. The answer is 21. Why? My Dear Aunt Sally says that the computer will do multiplication and division (there's no division here) to get 5+18−2 and then addition and subtraction to get 23−2 (and finally 21).

Don't take My Dear Aunt Sally too literally—multiplication does not take precedence over division, nor does addition take precedence over subtraction. But both multiplication and division do take precedence over either addition or subtraction. Consider this example:

```
PRINT 10/5*3-1+2
```

In this case, the division is performed first, followed by the multiplication, the subtraction, and finally the addition.

Most computers and calculators do math in this order without your having to worry about it. Notable exceptions are the Hewlett Packard calculators which use the *postfix* method of computation. Postfix or RPN (Reverse Polish Notation) calculators perform the operations in the order that they are entered. Calculators that use the *infix* method of computation need a set of rules, such as My Dear Aunt Sally, to determine the order in which to perform the calculations. Calculators that use the My Dear Aunt Sally rules are called *algebraic* calculators.

Gaining Control

To cause the computer to preempt My Dear Aunt Sally requires extra effort:

```
PRINT (5+3)*6-2
```

When parentheses appear in a problem, My Dear Aunt Sally quietly takes a back seat. Parentheses say "Do this first!" In other words, if 5 and 3 *must* be added together before being multiplied by 6, we must enclose these numbers in parentheses. The answer to the above problem is 46.

The Laws of Averages

Now let's look at a practical use for combining math operations—averaging. The average of two or more numbers is calculated by adding the numbers together and then dividing the total by the number of numbers. Let's say we want the average of 4 and 6. Suppose we typed:

```
PRINT 4+6/2
```

My Dear Aunt Sally will step in and try to multiply and divide first. Finding nothing to multiply, she'll divide the 6 by the 2 to get 3. Then she'll add the 3 to the 4 to get 7. This is definitely *not* the average of 4 and 6. To get the correct answer you must use parentheses:

```
PRINT (4+6)/2
```

Since parentheses take precedence, the numbers 4 and 6 will be added and their sum divided by 2 (the number of numbers to average) to get a correct average of 5.

To carry this further, let's write a simple program that averages a series of numbers which are typed into the computer. Let's write this program in a logical order and then add the frills.

To gather user data requires the use of INPUT. Let's start with line 100 and write the lower line numbers later:

```
100 INPUT "FIRST NUMBER";A
```

Here's where the variables which represent numbers come into play again. Variables consist of one or two letters such as *AB* or *HY*, or a combination of one letter and one digit, such as *A4* or *T6*. In the line above, *A* is the variable.

When the user types a number at the INPUT prompt and presses RETURN, that number immediately goes into the computer's memory and will from then on (at least in this program) be identified as *A*. We've seen this concept many times before. OK, let's get the next number:

```
110 INPUT "SECOND NUMBER";B
```

Experienced BASIC programmers will immediately recognize that this is not the most efficient way to write an averaging program, but since the thrust here is to learn math concepts, we'll continue. The second memory space we've set aside is called *B*. Let's add a couple more lines:

```
120 INPUT "THIRD NUMBER";C
130 INPUT "FOURTH NUMBER";D
```

These four user-input numbers which are now identified as *A*, *B*, *C*, and *D*, must be added together and their sum divided by 4. As in our previous example, the letters which now represent numbers must be enclosed in parentheses so they will be added *before* they're divided by 4:

```
140 PRINT "AVERAGE IS" (A+B+
    C+D)/4
```

That's the core of the program; it's runnable. But let's neaten it up a bit by adding a lower line number to clear the screen and move the cursor down a little:

```
90 PRINT "{CLR}{3 DOWN}"
```

When the program is listed, line 90 will automatically place itself in front of the previously written lines, and the program will, of course, run in line-number order.

You may want the lines as printed on the screen to be separated and spaced away from the left border. If so, go back to each line (except the first) and add a cursor down and a space just inside each first quotation mark, such as:

```
100 INPUT "{DOWN}{SPACE}FIRST
    NUMBER";A
```

There is a distinction between your doing math on computers and having computers do the math for you. The latter sounds much more interesting, so let's all begin to think of it this way. Next month, we'll investigate more ways computers can do math for you.

COMPUTE!'s Gazette is looking for utilities, games, applications educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it, on tape or disk to:

Submissions Reviewer
COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403

Please enclose an SASE if you wish to have the materials returned. Articles are reviewed within four weeks of submission.

machine language programming

Where To Locate

Jim Butterfield
Contributing Editor

Unlike BASIC programmers, machine language programmers have to worry about where their programs are placed in memory.

In this column, I often put machine language demonstration programs at decimal 8192 ($2000). This is an excellent place for programs, but since it is so universally used, other items (programs, variables, arrays, or strings) might write over this part of memory.

The Cassette Buffer

For quick test programs, the cassette buffer is ideal. A machine language program is unlikely to be disturbed in this area. Memory area $33C–$3E8 (decimal 828–1000) is quite safe. The 128 is an exception—the cassette buffer is at $B00–$BFF (decimal 2816–3071).

If you assemble (or POKE) a program here, it needs no special handling. If you load a program into this area, you must be careful about pointers. I'll discuss this in more depth later.

Free Space on the 128

The Commodore 64 has a block of memory not used by the system at $C000–$CFFF (decimal 49152–53247). This whopping 4K area is a favorite place to put machine language programs. Feel free to use it, but watch out for other utility programs which like to nest in the same space.

The Commodore 128 has a lot of free space at low addresses. The $1300–$17FF block can also be considered spare. Other chunks can be claimed if you know your system. For example, the RS-232 code uses the $C00–$DFF area. If you know that you won't be communicating with an RS-232 device, help yourself. Other areas become available if you don't use sprites, if you have few programmed keys, or if you never use DOS commands such as SCRATCH or DLOAD. If you plan to load a machine language program to any of these areas, check the "Pointers" section of this article.

Asking for Memory

One way to get memory is to ask BASIC to give up some of its working space. This workspace holds BASIC code and variables, arrays, and strings. On the 128, it holds code only.

It's best to do this before BASIC starts creating variables; otherwise, you may be asking for space that's already in use. After such an allocation, a CLR (clear) command allows the BASIC program to adjust to its new space.

Usurping memory space from the top of BASIC is the least complicated method. Most machines have a "top of BASIC" pointer. On the 64, this pointer is located at $37. Move this pointer down (then type CLR) and BASIC will give up the space.

The 128 has a special situation. Since variables, arrays, and strings are kept in Bank 1, you may help yourself to the space above BASIC without worrying about changing pointers. To simplify programming, you'll want your program to stay below $4000.

Memory space taken from the top of BASIC gives you a fairly permanent area for a program. Even if you load other BASIC programs, you'll keep the space you have taken unless you give it back. Only a complete reset changes everything back to its original state.

Space can be taken from the bottom of the BASIC area, but this is more complex. There are sometimes valid reasons for doing this on the 128, but it's best to avoid if possible.

If you plan to load a machine language program into an allocated area, check "Pointers," below.

A nearly ideal way to site a machine language program is to tack it onto the end of a BASIC program. The two parts—BASIC and machine language—can be loaded and saved as a unit—there's no need to worry about pointers.

Here's how to do it: After the ML program is placed somewhere above the end of the BASIC program, move up the pointer that marks the end of BASIC. On most machines, that's the Start-of-Variables pointer ($2D and $2E on the 64). On the 128, there's a special End-of-BASIC pointer at $1210. Once everything is in place and the pointer has been moved, type CLR and then save the program. From this point on, a single load brings in the two parts, BASIC and ML. Once the programs have been united, you *must not* change the BASIC program.

This system becomes difficult if the start-of-BASIC pointer has been changed. The program will be relocated as it loads (into the wrong place).

Pointers

If you load a machine language program using a BASIC direct command, you'll create a minor problem that may crash your system.

The LOAD command changes BASIC pointers around. That's OK when you load a BASIC program; the pointers do the right thing. But it's wrong when you load ML. To correct the problem, type NEW immediately following the LOAD command. If you have a 128, you can type BLOAD instead of LOAD and the pointers will be undisturbed.

If you arrange for a program to load the machine language segment, the pointers will *not* be disturbed. Unless your computer has a BLOAD command, you'll have to learn some new coding tricks to make it all work, but at least you won't need to worry about pointers.

A Guide to Commodore User Groups

Part 2

Mickey McLean

This annual *GAZETTE* feature provides an up-to-date list of user groups across the U.S., throughout Canada, and around the world. Last month, Part 1 listed user groups in states *A* through *M* (Alabama–Montana). This month, our list includes user groups in the remaining states (Nebraska–Wyoming) and from outside the U.S. (including APO addresses). Groups are listed in order according to zip code.

If your group does not appear in this list and you wish to be included, send your club name, address, and, if appropriate, your bulletin board service telephone number to:

User Group Update
COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403

Your group will then be listed in our monthly "User Group Update" column.

When writing to a user group for information, please remember to include with your request a stamped, self-addressed envelope.

NEBRASKA

Pathfinder Commodore User Group, P.O. Box 683, Fremont, NE 68025

Greater Omaha Commodore Users Group, P.O. Box 241155, Omaha, NE 68124

Mid-Nebraska Users of Commodore (MUC), 1920 N. Huston Ave., Grand Island, NE 68803

Platte Valley Computer Users Group (PVCUG), 1625 North St., Gering, NE 69341

NEVADA

SOG Commodore User Group, c/o Video Tonite, 1111 N. Nellis, Las Vegas, NV 89110

Silver State Computer Users Group, P.O. Box 81075, Las Vegas, NV 89180

NEW HAMPSHIRE

Manchester Commodore Users Group, P.O. Box 402, Merrimack, NH 03054

Commodore Help And Information Network (CHAIN Gang), P.O. Box 1155, Laconia, NH 03247

Commodore Users Group, 53 Page Rd., Bow, NH 03301

Monadnock Users Group (MUG) for Commodore Owners, 135 Liberty Ln., Keene, NH 03431

NEW JERSEY

Data Exchange—Beneficial Users Group 64/128 (DE-BUG 64/128), 213 Burns Way, Fanwood, NJ 07023

Info-64, P.O. Box BC, Paterson, NJ 07509

Hillsdale Commodore 64 Users Club, 32 Esplanade Lake Dr., Hillsdale, NJ 07642

Gold Crown Commodore Club, 517 Center Pl., Teaneck, NJ 07666

Commodore 64 Beginners Group, 680 Leigh Terrace, Westwood, NJ 07675

Garden State Commodore User's Group Inc., 89 Stratford Rd., Tinton Falls, NJ 07724

L & L Commodore 64 User Group, 1 Longstreet Rd., Manalapan, NJ 07726

Commodore User Group of Central New Jersey, 112 Old Bridge Rd., Matawan, NJ 07747

South Jersey C-64 Users Group, 507 N. Dudley Ave., Ventnor, NJ 08406

Bordentown Area Commodore Users Group, P.O. Box 381, Bordentown, NJ 08505

Commodore Computer Collection Club, 72 Pine Dr., Roosevelt, NJ 08555

Commodore Users Group of Ocean County, 981 Cedar Grove Rd., Toms River, NJ 08753

Commodore E. Brunswick Users Group (CE-BUG), 9 Kings Rd., E. Brunswick, NJ 08816

Somerset Users Group, 49 Marcy St., Somerset, NJ 08873

NEW MEXICO

New Mexico Commodore User's Group, P.O. Box 37127, Albuquerque, NM 87176

64-X, 501 Camino Sin Nombre, Santa Fe, NM 87501

Los Alamos Commodore Users Group, 4125-D Sycamore Dr., Los Alamos, NM 87544

Taos Area Commodore User's Group, P.O. Box 5089, Taos, NM 87571

The Southern New Mexico Commodore User's Group, P.O. Box 4437, Uni. Park Brch., Las Cruces, NM 88003

NEW YORK

Kids Computer News, 2714 University Ave., #1B, Kingsbridge Heights, NY 10468-3424

Bronx Users Group (BUG-64), P.O. Box 523, Bronx, NY 10475

Folklife Terminal Club, Box 555-R, Co-op City Station, Bronx, NY 10475

For Your Computer Only, 35 Belleview Ave., Ossining, NY 10562

St. Francis College Microcomputer Users' Group, Microcomputer Center, 180 Remsen St., Brooklyn, NY 11201

The Computer Freaks, 84 Sterling Pl., Brooklyn, NY 11217

Brooklyn Commodore User's Group, 1735 E. 13th St., Apt.7N, Brooklyn, NY 11229-1950

Commodore Users Group of Greater New York, 190-25 Woodhull Ave., Hollis, NY 11423

Commodore Long Island Club, Inc., 2949 Roxbury Rd., Oceanside, NY 11572

Elite Commodore Users Group, 151 DuBois Ave., Sea Cliff, NY 11579

Brentwood 64/128 Computer Club, Pub. Lib., 2nd Ave. & 4th St., Brentwood, NY 11717

MI-Comm User Group, 26 Azalea Rd., Levittown, NY 11756

Amiga-64 User Group, P.O. Box 280, Lindenhurst, NY 11757

Club 64, 174 Maple Ave., Patchogue, NY 11772

LIVICS Commodore Users Group, 15 Hastings Dr., Stony Brook, NY 11790

Ridge C-64 Users Group, 94 Ridge Rd., Ridge, NY 11961

Mohawk Valley Computer User Group, R.D. #2, Box 177, Johnstown, NY 12095

Tri City Commodore User's Group (TCCUG), P.O. Box 12742, Albany, NY 12212-2742

Hudson Valley Commodore Club, P.O. Box 2190, Kingston, NY 12401

Orange County Commodore Users Group (OC-CUG), 7 Cottage Ave., Newburgh, NY 12550

Commodore 64 User Group of Orange County, 74 Cardinal Dr., Poughkeepsie, NY 12601

Frontier Computer Users, R.F.D. #1, Box 352A, Chazy, NY 12921 (BBS# 518-846-8803)

Malone Commodore User Group (MALCUG), 27 Bentley Ave., Malone, NY 12953 (BBS# 518-483-1035)

Morrisonville Commodore Users Group, 61 E. Main St., Morrisonville, NY 12962
Oswego Commodore User Group, 424 Mahar Hall, State University College, Oswego, NY 13126
Central New York Commodore Users Group (CNYCUG), 6887 Peck Rd., Syracuse, NY 13209
The Commodore Computer Club of Syracuse, P.O. Box 2232, Syracuse, NY 13220
Utica Commodore User Group, 1801 Storrs Ave., Utica, NY 13501
Commodore Users Group of Massena (COMA), 7 Water St., Massena, NY 13662
Leatherstocking Computer User's Club, P.O. Box 1284, Oneonta, NY 13820
Triple Cities Commodore Society, 1713 Castle Gardens Rd., Vestal, NY 13850
Commodore Buffalo User Group (COMBUG), P.O. Box 1005, Tonawanda, NY 14151-1005
The Rainbow International C-64 Users' Group, 3 Expressway Village, Niagara Falls, NY 14304
The Niagara Falls Commodore Club, 2405 Willow Ave., Niagara Falls, NY 14305
The Lost Boys (TLB), 20 Mountain Rise, Fairport, NY 14450
Geneva Commodore Users Group, 84 Pleasant St., Geneva, NY 14456
Commodore Users Group of Rochester (CUGOR), P.O. Box 23463, Rochester, NY 14692
Finger Lakes Area Komputer Experts (FLAKES), 86 West Lake Rd., Hammondsport, NY 14840

NORTH CAROLINA

Foothills User Group, 1012 Jesse Tr., Mount Airy, NC 27030
Sanlee Commodore Club, 5822 Blue Jay Dr., Sanford, NC 27330
Triad Commodore Users Group, P.O. Box 10833, Greensboro, NC 27404 (BBS# 919-288-0372)
Carolina Commodore Computer Club, P.O. Box 2664, Raleigh, NC 27602-2664
Lincolnton Commodore Users Group, Rt. 3, Box 351, Lincolnton, NC 28092
Salisbury Compute, Rt. 1, Box 349B, Salisbury, NC 28144
Cleveland/Gaston Commodore User's Group (CGCUG), 2048 McBrayer Springs Rd., Shelby, NC 28150
Wilmington Commodore Users Group, 2104 Wisteria Dr., Wilmington, NC 28401
Down East Commodore Users Group, P.O. Box 1255, Havelock, NC 28532
Greater Onslow Commodore User Group, P.O. Box 7171, 910 Winchester Rd., Jacksonville, NC 28540
Unifour Commodore Users Group, P.O. Box 9324, Hickory, NC 28603-9324
Asheville-Buncombe User Group (A-BUG), P.O. Box 15578, Asheville, NC 28813

NORTH DAKOTA

Central Dakota Commodore Club, P.O. Box 1584, Bismarck, ND 58502-1584

OHIO

The Commodore User Group, Inc. (TCUG), P.O. Box 63, Brice, OH 43109
Central Ohio Commodore Users Group, P.O. Box 28229, Columbus, OH 43228-0229
Marion Ohio Commodore User Group (MOCUG), 775 Wolfinger Rd., Marion, OH 43302
South Toledo Commodore Computer Club, P.O. Box 6086, Toledo, OH 43614
Commodore Computer Club of Toledo (CCCT), P.O. Box 8909, Toledo, OH 43623
Basic Bits Commodore Group, P.O. Box 447, N. Ridgeville, OH 44039
Northeast Ohio Commodore User Group, P.O. Box 718, Mentor, OH 44061-0015
C128 Network, 321 Kensington, Vermilion, OH 44089
Commodore Preference Users Connection (CPU Connection), P.O. Box 42032, Brook Park, OH 44142
Cuyahoga Falls Commodore Club, P.O. Box 3025, Cuyahoga Falls, OH 44223
Akron Area Commodore User Group (AACUG), P.O. Box 685, Akron, OH 44309
TRUMCUG, P.O. Box 8632, Warren, OH 44484
C-128/64 Amateur Computer Club, P.O. Box 1180, Youngstown, OH 44501
Commodore Users Group, 29425 Bettler Rd., Box 175, Dennison, OH 44621
Canton/Akron/Massillon Users Group (CAMUG), P.O. Box 2423, North Canton, OH 44720
Mid-Ohio Commodore User's Club, R.D. #2, Box 10A, Cassell Rd., Butler, OH 44822
Commodore Erie Bay Users Group (CEBUG), P.O. Box 1461, Sandusky, OH 44870
Cincinnati Commodore Computer Club, Box 450, Owensville, OH 45160
Southwestern Ohio Commodore Users Group (SWOCUG), P.O. Box 46644, Cincinnati, OH 45246
Dayton Area Commodore Users Group (DACUG), 2040 Turnbull Rd., Dayton, OH 45431
PMUG, P.O. Box 31744, Dayton, OH 45431
Hancock User's Group (HUG), P.O. Box 1651, Findlay OH 45839-1651

OKLAHOMA

Commodore User's Group of Lawton, P.O. Box 3392, Lawton, OK 73502
Commodore Users of Bartlesville, 1704 S. Osage, Bartlesville, OK 74003
Stillwater Computer Society, 3124 N. Lincoln, Stillwater, OK 74075
Tulsa Area Commodore Users Group (TACUG), P.O. Box 691842, Tulsa, OK 74169-1842
Muskogee Commodore Users Group (MCUG), 2429 Georgia, Muskogee, OK 74403

OREGON

Commodore East County (CEC), 2424 S.E. Evans Ave., Troutdale, OR 97060-2328
United States Commodore Users Group, P.O. Box 2310, Roseburg, OR 97470
Caveman Commodore Computer Club (CCCC), 5863 Lower River Rd., Grants Pass, OR 97526

PENNSYLVANIA

Beaver County Area Commodore User's Group (BCACUG), P.O. Box 412, New Brighton, PA 15066
A-K 64 User Group, 1762 Fairmont St., New Kensington, PA 15068
Bettis Commodore Users Group, 592 Arbor Lane, Pittsburgh, PA 15236
Pittsburgh Commodore Group (PCG), P.O. Box 16126, Green Tree, PA 15242
Westmoreland Computer Users Club (Commodore Section), P.O. Box 3051, Greensburg, PA 15601
Butler Commodore 64 User Group, P.O. Box 2408, Butler, PA 16001
Castle Commodore Computer Club, P.O. Box 961, New Castle, PA 16103
North Coast Commodore Users Group Erie, P.O. Box 6117, Erie, PA 16512-6117
PCUC, C. Rhoads, Milton Hershey School—Ridgeway, P.O. Box 830, Hershey, PA 17033-0830
Blue Juniata Commodore Users Group, 18 Ridge Rd., Lewistown, PA 17044
Huntingdon County Hackers, P.O. Box 132, Mill Creek, PA 17060
Southern York County Commodore Users Group, 5E Lark Circle, York, PA 17404
White Rose Commodore Users Group, 760 Fireside Rd., York, PA 17404
West Branch Commodore Users Group, P.O. Box 995, Williamsport, PA 17703
CenPUG for Commodore, R.D. #4, Box 99A, Jersey Shore, PA 17740
Susquehanna Valley User Group, P.O. Box 90, Hummels Wharf, PA 17831
Lehigh Valley Commodore User Group, 2228 Baker Drive, Allentown, PA 18102
Ingersol Rand Computer Users Group (IRCUG), R.D. #1, Box 173, Sayre, PA 18840
Lower Bucks Users Group, P.O. Box 397, Croydon, PA 19020-0959
Environmental Protection Agency (EPA) Commodore Users Group, Edward H. Cohen, 1712 Aidenn Lair Rd., Dresher, PA 19025 *(Note: Open to all federal government employees and their families.)*
Horsham Amiga/64, 20-A Lumber Jack Circle, Horsham, PA 19044
Commodore Users Group, Philadelphia Area Computer Society, P.O. Box 57096, Philadelphia, PA 19111-7096
Main Line Commodore Users Group (MLCUG), 1046 General Allen Lane, West Chester, PA 19382
Worldwide Commodore Users Group (International Headquarters), P.O. Box 337, Blue Bell, PA 19422
Upper Buxmont CBM Users Group, 1206 Cowpath Rd., Hatfield, PA 19440
Plymouth-Whitemarsh Commodore Users Group, 4029 Woodruff Rd., Lafayette Hill, PA 19444
Commodore Colony, 303 Old Airport Rd., Douglassville, PA 19518
Commodore Users of Berks (CUB), 810 Sledge Ave., West Lawn, PA 19609

RHODE ISLAND

No listings.

SOUTH CAROLINA

Commodore Computer Club of Columbia, P.O. Box 5691, Columbia, SC 29250
BIBS, S.P.O. S89, Charleston, SC 29424

SOUTH DAKOTA

Aberdeen Commodore Club, 115 Church Dr., Aberdeen, SD 57401
Port 64, P.O. Box 1191, Rapid City, SD 57709 (BBS# 605-348-9443)

TENNESSEE

CHIP, 4952, Shihmen Dr., Antioch, TN 37013
Commodore Association of the Southeast (CASE), P.O. Box 2745, Clarksville, TN 37042-2745
Nashville Commodore User Group, P.O. Box 121282, Nashville, TN 37212 (BBS# 615-833-8642)
Commodore Computer Club, P.O. Box 96, Estill Springs, TN 37330
Howard S. Bacon, KC4CIQ, 213 Holly Ave., South Pittsburg, TN 37380-1313
Memphis-East Commodore Organization (MECO), 6870 Sauterne Cove, Memphis, TN 38115
Commodore PC-10/MS-DOS Users Group, 3318 Keystone Ave., Memphis, TN 38128
Raleigh-Bartlett Hackers CUG, James Patrick, 3457 Gatewood Dr., Memphis, TN 38134
Memphis Commodore Users Club, P.O. Box 34095, Bartlett, TN 38134-0095
Old Hickory Commodore Users Group, 542 Lambuth Blvd., Jackson, TN 38301

TEXAS

PD Users of Texas, 135 Maytrail, McKinney, TX 75069
Society of Computer Owners and PET Enthusiasts (SCOPE), P.O. Box 3095, Richardson, TX 75083
128 Users of Dallas/Ft. Worth, P.O. Box 28277, Dallas, TX 75228-0277 (BBS# 214-328-7261)
Longview Computer Users Group, P.O. Box 9284, Longview, TX 75608
Mid-Cities Commodore Club, P.O. Box 1578, Bedford, TX 76095
Commodore Languages and Operations Group (C/LOG), Rt. 1, Box 158, Groesbeck, TX 76642
East Texas Commodore User Group, 2200 Montgomery Park Blvd., No. 616, Conroe, TX 77304
Commodore Houston User Group (CHUG), P.O. Box 612, Tomball, TX 77375 (BBS# 713-470-2484)
The Willis Commodore Users Group, 8 Forest Trails, Willis, TX 77378
Tri-County Commodore Users Association (TCCUA), 557 Lakeview Circle, New Braunfels, TX 78130
Commodore Users of San Antonio, P.O. Box 380732, San Antonio, TX 78280
Commodore User Group of Austin, P.O. Box 49138, Austin, TX 78765
Top of Texas Commodore (TOTCOM), Box 2851, Pampa, TX 79066-2851
Commodore Users of Texas (CUT), 7007 Memphis Ave., Lubbock, TX 79413

UTAH

Cache Valley Commodore Users Group, 315 W. 400 S., Smithfield, UT 84335
Moab Commodore User's Group, 860 S. Antiquity Ln., Moab, UT 84532
Payson Area Commodore Users Group (PAC), P.O. Box 525, Salem, UT 84653
Southern Utah Commodore Hobbyists, 528 N. Blue Sky Dr., Cedar City, UT 84720

VERMONT

Champlain Valley Commodore Users Group, 6 Mayfair St., South Burlington, VT 05403

VIRGINIA

Arlington Victims Commodore Computer Club, 9206 Annhurst St., Fairfax, VA 22031

Capitol Area Commodore Enthusiasts (CACE), 607 Abbotts Lane, Falls Church, VA 22046

Washington Area Commodore User Group, P.O. Box 684, Springfield, VA 22150-0684

Dale City Commodore Users Group, Inc., P.O. Box 2265, Dale City, VA 22193-0265

Fredericksburg Commodore Club, P.O. Box 8438, Fredericksburg, VA 22404-8438

Shenandoah Valley Commodore Users Group, Mountain Falls Rte., Box 77FF, Winchester, VA 22601

The Richmond Area Commodore Enthusiasts (TRACE), 2920 Pinehurst Rd., Richmond, VA 23228

South Richmond Commodore User Group, 11101 Cranbeck Ct., Richmond, VA 23235

Peninsula Commodore Users Group, P.O. Box L, Hampton, VA 23666

Portsmouth Commodore Users Group (PCUG), P.O. Box 6561, Portsmouth, VA 23703

Southside Virginia Commodore Users Group, 315 Lakeview Ave., Colonial Heights, VA 23834

Commodore Users of Franklin, 1201 N. High St., Franklin, VA 23851

Henry County Commodore Computer Club, Rt. 9, Box 61, Martinsville, VA 24112

Lynchburg User Group, Rt. 2, Box 180, Lynchburg, VA 24501

WASHINGTON

64 E/T, 127-182 Pl. SW, Bothell, WA 98012

The Covington Commodore Connection, 26243 172 SE, Kent, WA 98042

NW Commodore User Group, 2565 Dexter N, #203, Seattle, WA 98109

PSACE, 1313 5th Ave. W, Seattle, WA 98119-3410

UW Commodore User Group, P.O. Box 75029, Seattle, WA 98125

Arlington Commodore Users' Group, 4416-126th Place NE, Marysville, WA 98270

Club 64, 6735 Tracyton Blvd. NW, Bremerton, WA 98310

World Wide User Group, P.O. Box 98682, Tacoma, WA 98498

Commodore Users of Grays Harbor, 1111 Fordney, Aberdeen, WA 98520

Lewis County Commodore Users Group, 803 Euclid Way, Centralia, WA 98531

Longview Commodore Users Group, 626 26th Ave., Longview, WA 98632

North Forty Commodore User Group, 2903 Florida St., Longview, WA 98632

Tri-City Commodore Computer Club (TC CUBED), P.O. Box 224, Richland, WA 99352

Blue Mountain Commodore Users, 550 S. 2nd Ave., Walla Walla, WA 99362-3149

WEST VIRGINIA

Bluefield User Group 20/64 (BUG), P.O. Box 1190, Bluefield, WV 24701

Kanawha Valley Commodore Computer Club, P.O. Box 252, Dunbar, WV 25064

Commodore Home User's Group (CHUG), 81 Lynwood Ave., Wheeling, WV 26003

Mid-Ohio Valley Commodore Club, Inc. (MOVCC), P.O. Box 2222, Parkersburg, WV 26101-2222

Northern West Virginia C-64 Club, 228 Grand St., Morgantown, WV 26505

WISCONSIN

Wisconsin Association of Vic/Commodore Enthusiasts (WAVE), 840 Park Manor Ct., Cedarburg, WI 53012

Lakeshore Commodore Computer Club, 1738 N. 27th Pl., Sheboygan, WI 53081

Commodore Hobbyists Involved In Personal Systems (CHIPS), P.O. Box 1006, West Bend, WI 53095

715 Commodore Users Group, 1052 S. Fork Dr., River Falls, WI 54022

Kewaunee & Brown County Computer Club (KB Triple C), E4125 Krok, Kewaunee, WI 54216

COMM-BAY64, P.O. Box 1152, Green Bay, WI 54305

Price County Computer User Group, Rt. 2, Box 532, Phillips, WI 54555

Western Wisconsin La Crosse Area Commodore Users Group, 1545 Loomis St., La Crosse, WI 54603

Menomonie Area Commodore Users Group, 510 12th St., Menomonie, WI 54701

Eau Claire Area CBM 64 User Group, 1527 W. Mead St., Eau Claire, WI 54703

Fond du Lac Area Commodore Users Club, P.O. Box 1432, Fond du Lac, WI 54936-1432

WYOMING

Cheyenne Association of Computer Enthusiasts (CACE), P.O. Box 1733, Cheyenne, WY 82003

Outside the U.S.

APO

Commodore Computer Users Group Heidelberg, Robert H. Jacquot, P.O. Box 232, Gen. Del., APO NY 09102, Tel. 06223-5614 (West Germany)

Stuttgart Local Users Group, c/o Don Rimestad, HHC VII Corps, Box 228, APO NY 09107-0007 (West Germany)

Commodore Base User's Group (C-BUG), Attn: Computer Club Recreation Center/SSRR, RAF Chicksands, APO NY 09193 (Shefford Beds., England SG17 5PZ)

U.S. Naval Station Guantanamo Bay Cuba Computer Users Group, 0SC Mark Merkling, FTG Box 605, FPO New York, NY 09593

AUSTRALIA

Commodore Computer Users Group (QLD) Inc., P.O. Box 274, Springwood Qld. 4127, Brisbane, Australia

Commodore Computer Users Group (Townsville), 9 Bryant St., Cranbrook, Townsville 4814, Qld., Australia

Commodore User Group (ACT), P.O. Box 599, Belconnen, ACT, Australia 2616

Hedland Commodore Computer Group, David Warren, P.O. Box 2551, South Hedland 6722, Western Australia

Melbourne Commodore Computer Club Inc., P.O. Box 177, Box Hill, Victoria 3128, Australia

South Australian Commodore Computer Users Group, P.O. Box 427, North Adelaide, SA 5006, Australia

BELGIUM

L'Amiral Club C=64 & Amiga, c/o Alain Trinteler, P.O. Box 41, B-1090, Brussels, Belgium

BRAZIL

Brasilian General Computers by Piagesoft, Flavio Joao Piagentini, Rua Heitor de Moraes 856-Pacaembu, Sao Paulo-SP-Cep01237-Brasil

Commodore Grupos de Usuarios, Carlos A. Silva, Rua Gen. Roca 176, Apt. 501, 20521 Rio de Janeiro RJ, Brasil

Commodore Users Group Porto Alegre, Ferreira de Abreu 91/3, 90040 Porto Alegre RS, Brasil

Curitiba Commodore Club, R. Ver. Garcia R. Velho 33, Apto. 41—Barro Cabral, 80030 Curitiba-PR-Brasil

CANADA

British Columbia

Castlegar Commodore Computer Club, R.R. 1, Site 37, Comp. 7, Castlegar, British Columbia, Canada V1N 3H7

Chilliwack Commodore Computer Club, P.O. Box 413, Sardis, British Columbia, Canada V2R 1A7

Commodore 64 Soft Swap, 4635 210 St., Langley, British Columbia, Canada V3A-2L3

C64 International Users Group, 1544 West 59th Ave., Vancouver, British Columbia, Canada V6P 1Z2

Juan de Fuca C64/128 Users' Group, P.O. Box 7188, Depot 4, Victoria, British Columbia, Canada V9B 4Z3

Port Coquitlam Computer Club, 1752 Renton Way, Port Coquitlam, British Columbia, Canada V3B 2R7

Powell River Commodore User Group (PRCUG), 4858 Fernwood Ave., Powell River, British Columbia, Canada V8A 3L8

Prince George Commodore User's Association (PGCUA), 1491-17th Ave., Prince George, B.C. Canada V2L 3Z2

Universal Commodore Users Group, 1518 Myrtle, Victoria, British Columbia, Canada V8R 2Z8

Manitoba

Commodore Concepts Users Group (CCUG), Box 783, Steinbach, Manitoba, Canada R0A 2A0

New Brunswick

The FORCE, P.O. Box 2203 MPO, Saint John, New Brunswick, Canada E2L 3V1

Moncton Users Group, Box 2984, STN A, Moncton, New Brunswick, Canada E1C 8T8

Ontario

Barrie User Group, P.O. Box 22224, Barrie, Ontario, Canada L4M 5R3

Brampton User's Group (BUG), P.O. Box 384, Brampton, Ontario, Canada L6V 2L3

Hamilton Commodore Users' Group, 201 Millen Rd., Stoney Creek, Ontario, Canada L8E 2G6

Midland Commodore Users Group, c/o W. E. McKibbon, R.R. #3, Penetang, Ontario, Canada L0K 1P0

Ottawa Home Computing Club, P.O. Box 4164, Station C, Ottawa, Ontario, Canada K1Y 4P3

Sarnia Commodore User Group, 1276 Giffel Rd., Sarnia, Ontario, Canada N7S 3K7

The Sault Commodore Computer Club, 7 Chaumier Pl., Sault Ste. Marie, Ontario, Canada P6A 6P3

3-D Commodore 64 User Group, c/o Jonathan St. Clair, 10 Queen St., Branchton, Ontario, Canada N0B 1L0

Ultima 64 Computer Club, c/o Centre des Jeunes, 20 Ste.-Anne St., Sudbury, Ontario, Canada P3C 5N4

Quebec

CICN Commodore Group, P.O. Box 564, Septlles, P. Quebec, Canada G4R 4X7

Club Commodore Champlain, P.O. Box 522, Boucherville, Quebec, Canada J4B 6Y2

C-64 Users Group of Canada, Snowdon, P.O. Box 1205, Montreal, Quebec, Canada H3X 3Y3 (BBS# 514-739-3446)

L'Association de Micro Informatique de l'Estrie (L'AMIE), P.O. Box 1627, Sherbrooke, Quebec, Canada J1H 5M4

Yukon

64s North of 60, P.O. Box 5438, Whitehorse, Yukon, Canada Y1A 5H4

COLOMBIA

Club Commodore Colombia, c/o Jorge Bonilla, Avenida Caracas No. 52-79 Of. 401, P.O. Box 36621, Bogota, Colombia, South America

ComSoft Commodore User Group, D.F. Cardenas, Apartado Aereo 9872, Cali, Colombia, South America

COSTA RICA

Club Commodore de Tibas, Marvin Vega, P.O. Box 516, Tibas, San Jose, Costa Rica

DENMARK

MIDTJYDSK Computer Klub (M.C.K.), Jegstrupvej 86, 8800 Viborg, Denmark

DOMINICAN REPUBLIC

RD-C-64 Users Group, David Braverman, Centro Ed. de Bonao, Ave. Jose Marti, Bonao, Dominican Republic

ENGLAND

Rolls Royce International Computer Users Group, Tom Lomax, 17 Greystoke Drive, Bilborough, Nottingham, Nottinghamshire, England NG8 4HW

FINLAND

Commodore Micro Amateurs, P.O. Box 852, SF-00101 Helsinki, Finland

User's Club of PTT, c/o Matti Pohtola, Teletutkimuslaitoksen, Mikrotietokonekerho, Kiviaidankatu 2 F, 00210 Helsinki 21, Finland

INDIA

Commodore Users Group, c/o S. Ram Gopal, 1 B, 19th D Main Rd., Rajajinagar First Block, Bangalore 560 010, India

ITALY

Commodore 64 Computer Users Group of Rome, c/o Pluchinotta Via di S. Agnese 22, 00198 Rome, Italy

Software Computer Club, Box N-39, 13060 Valdengo (VC) Italy

JAPAN

Commodore Fan Club, Koji Sugimura, 2-1-10-1107 Higashi-Taishi Yao Osaka, Japan 581

MALAYSIA

Commodore Users Exchange (CUE), No. 1 Jalan SS 18/2B, 47500 Subang Jaya, Selangor, Malaysia

MEXICO

Bose Commodore Users Group, Lic. Oscar E. Saenz Salinas, Av. Francisco I. Madero con, Oriente 3 #1001, Cd. Rio Bravo, Tam., Mexico

Club Commodore de Juarez, Calle del Manantial #1448, Ciudad Juarez, Chihuahua, Mexico 32500

Club Commodore del Sureste, Carlos M. Diaz Escoffie, Col. G. Gineres 25 X 14 192 A, 97070 Merida Yucatan, Mexico

Club Herra*Tec C64, Alain Bojmal, Vicente Suarez 25, 06100 Mexico, D.F.

Commodore Users of Puerto Vallarta, APDO 86 CP 48300, Puerto Vallarta, Jalisco, Mexico

Golden Chips Users Group, Ibsen 67 #2, Mexico D.F., Mexico 11560

Grupo Commodore del Suereste, Barcazas #115, Fracc: Jose Colomo, 86100 Villahermosa, Tabasco, Mexico

THE NETHERLANDS

Comiac-Software User Group, Jarrod Bernadina, Kortenaerstraat 12, 2712 KJ Zietermeer, The Netherlands

NETHERLANDS ANTILLES

Commodore 64 User Group, Ludwin Statie, Caracasbaaiweg #94, Curacao, Netherlands Antilles

NEW ZEALAND

Hokitika Commodore Computer Users Group, 185 Sewell St., Hokitika, New Zealand

N.Z. Commodore User's Group (Wellington) Inc., P.O. Box 2828, Wellington, New Zealand

PAKISTAN

Computer Users of Pakistan, 882/14, Federal B' Area, Karachi-38, Pakistan

PUERTO RICO

East Commodore User's Club, c/o Nelson Jimenez Marquez, Jardines Judelly Edif. 4, Apt. 36, Las Piedras, Puerto Rico

SAUDI ARABIA

Commodore League of Riyadh (CLR), P.O. Box 16216, Riyadh 11464, Saudi Arabia

REPUBLIC OF SINGAPORE

The Commodore User Club, Bedok Central P.O. Box 693, Singapore 9146, Republic of Singapore

SPAIN

Costa Blanca Computer Club, c/o Ed Kelly, Montebello 25, La Nucia-Alicante, Spain 03530

SWEDEN

Commodore-Klubben, Lars Persson, Box 18158, 200 32 Malmo, Sweden

Computer Club Sweden, Hans Engstrom, P.O. Box 7040, S-103 86 Stockholm, Sweden

SWITZERLAND

Computer Anwender Club, Postfach 29, 8042 Zurich, Switzerland

WEST GERMANY

International Commodore Owners Network (ICON), 55 Westfallen Strasse, Apt. 2, 6200 Wiesbaden, West Germany

WEST INDIES

Commodore Computer Club, Jim Lynch, P.O. Box 318, St. Johns, Antigua, West Indies

Jericho

Robert Bixby

"Jericho" adds a new twist to the venerable line of breakout games. There are no walls here—you have to keep the ball on the screen no matter which way it bounces. For the 64. Joystick required.

Bad news! Jericho, the super moth, has broken into your competitor's kilt factory. You've got to pitch in and help. But you know there's only one thing to do—keep that moth in the warehouse until he's eaten every scrap of cloth.

"Jericho" is a variation of the popular breakout-style game, where you try to keep a ball bouncing inbounds until all the bricks on the screen are gone. In Jericho, the ball is a moth, and the bricks are colorful pieces of cloth.

Getting Started

Jericho is written in machine language. Type it in with "MLX," the machine language entry program found elsewhere in this issue. When MLX prompts you for starting and ending addresses, respond with the following values:

Starting address: 0801
Ending address: 0E78

Enter the data for Jericho. Be sure to save a copy to tape or disk before exiting MLX.

When you're ready to play Jericho, load and run the program. Although Jericho is written in machine language, it can be loaded, saved, and run like a BASIC program.

First Game

Plug a joystick into port 2. When you type RUN, you'll see the game's demo mode, which is very much like the game itself. In the center of the screen is the cloth that is used to make the kilts. Jericho the moth flaps around, soaring from place to place, until he bumps into cloth. He then eats a section and moves on.

Try to make the moth eat as much of the colorful kilt as possible in this clever takeoff on the classic Breakout game.

Since moths are so flighty, Jericho is as likely to fly right out the window as he is to stay in the building. In the demo mode, all four edges of the screen are walled off. This keeps Jericho in.

Press the fire button to begin the game. The walls disappear. You now have control of two large paddles. These paddles can be moved around all sides of the screen. Use them to bounce Jericho back into the kilt factory whenever he strays.

Joystick control is easy. Press the stick forward to move the paddles clockwise and pull back to move them counterclockwise.

Sooner or later, no matter how careful you are, Jericho will slip away. Press the fire button to bring him back. This can be done ten times. When Jericho escapes for the final time, press RETURN to begin a new game.

Your current score and number of lives are displayed in the upper left corner of the screen.

See program listing on page 78.

3-D Bar Grapher for the 128

Jon Atkinson

Transform ordinary numbers into bold, multicolored three-dimensional graphs with this useful application for the 128. You can keep track of your expenses, earnings, or just about anything else you might imagine. A color monitor is suggested.

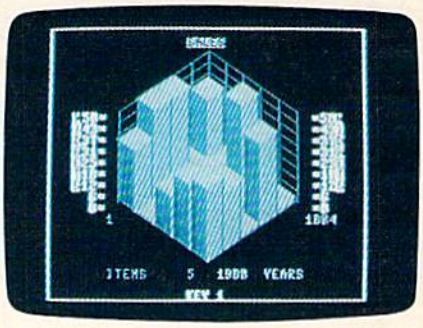
Before the computer age, plotting graphs was a time-consuming chore that had to be done by hand. With "3-D Bar Grapher," however, graphing spreadsheets is fun and easy. Using multicolor and 3-dimensional charts, 3-D Grapher enables you to see where your money is going, to gauge how your investments are doing, to plot as many as 20 years of statistics incorporating as many as 20 different items, and much more. You can save graphs to disk, or by using a printer and a screen dump program (such as *The Print Shop* by Broderbund), you can make a printout.

Getting Started

Since 3-D Bar Grapher is written entirely in BASIC, simply set your 128 for 40 columns, type the program in, save a copy to disk, and type RUN. 3-D Bar Grapher begins by asking you the first of several questions. Pressing RETURN at a prompt enters the default response. This is useful if you're trying the program for the first time, or if you're not sure what to enter. The first two prompts involve looking at previously saved graphs. For now, choose N for these prompts. (We'll discuss saving graphs later on.).

Now you begin to input the actual values for your 3-D graph. First, enter the title of the graph. This can be as long as 40 characters and is displayed at the top of your graph. The next prompt asks what you want displayed at the sides of your graph. This is called the *value representation* and is a label for the graph's height or the *z* dimension. Common values are dollars, millions, or number of units sold.

Next, 3-D Bar Grapher asks for the beginning and ending year. The year span must be in the range 0–20. For example, for a graph for this decade, enter 80 for the beginning year and 88 for the ending year. These values are displayed on the *x* length of the graph. If the same year is chosen for starting and ending values, the computer asks for the beginning and ending month, a number in the range 1–12. The ending month is normally calculated 12 months ahead, but can be changed by entering the number of the ending month (for example, 8 for August). Next you're asked for the number, within the range 1–20, of items to graph. In graphing a home budget, for example, you might have monthly payments on a house or a car, travel expenses, medical bills, entertainment expenses, and miscellaneous, for a total of five items. These values are represented on the *y* length of the graph.



Just one example of the colorful 3-D graphs you can create with this versatile program.

The next two prompts ask for the graphing range. The minimum and maximum values are 0 and 99,999, respectively. If one million or any other number greater than 99,999 is needed, all you have to do is enter the value as millions or billions and use 0–100 for the graphing range.

Impact Colors

Now the three multicolors have to be entered using values in the range 1–15. The defaults are 15—light blue, 4—cyan, and 7—dark blue. To make your graph more pleasing to the eye and to strengthen the 3-D illusion, three shades of a single color are recommended.

Recommended Color Combinations

shade	color 1	color 2	color 3
blue	15	4	7
red	9	11	10
gray	13	16	12
green	14	6	2

After the colors have been chosen, each value must be entered at a prompt. The total number of values can be calculated by multiplying the number of years or months by the number of items. There are no default values for this part of the program. If you press RETURN without entering any data, the program assumes you've entered a 0. When you've finished with the values, item keys may be entered. These are optional, but they make a more readable and attractive chart. For an expense graph, for example, you might have the following keys' values: ITEM 1 = HOUSE, ITEM 2 = CAR, ITEM 3 = TRAVEL, and ITEM 4 = MEDICAL. You can also place a comment in the key area.

You can have a border drawn around the screen after the graph has been completed by answering *yes* to the next prompt. The border can give a printout a more polished look. Finally, you're asked if fast mode is to be turned on. Fast mode cuts the drawing time of the graph in half, but the screen will be blanked during the process. It's important to run the program in slow mode until you're sure you've eliminated any typing errors, because you can't see error messages while in fast mode.

Finished Product

Now the graph will be drawn on a 3-D chart, starting with the ending year or month in the top corner. The starting year or month is located near the bottom of the screen and the ending year or month further up, near mid-screen. The bar's length, width, and height depend on the number of items, the number of years or months, and the value of that particular cell.

After the graph has been completely plotted, press any key to return to text mode. Here you have three options: Save the graph, plot another graph, or exit to BASIC. If you choose Y to save the graph, you're prompted for the filename of the graph. Note that each graph takes a space of 33 blocks on the disk, so be sure to have enough room on a disk before attempting to save anything. After you've saved the graph, you return to the beginning of the program to construct another graph.

Loading Graphs

The first prompt in 3-D Bar Grapher loads graphs from disk. After selecting this option, you can display a directory before entering a filename and your color choices. The graph is then displayed until any key is pressed. Unfortunately, you can't add to the data from an old graph. If you have a graph with expenses from January to May, for example, when June comes along, you won't be able to add the June data. The only solution is to reenter all your old data and then the new information.

Each graph resides in memory locations 8192–16383, so hi-res dumps can be made with *The Print Shop*. Load your graph using *get screen* from the Screen Magic section of *The Print Shop*.

See program listing on page 70.

Make music With Your 64 or 128!

COMPUTE!'s Music System for the Commodore 64 and 128
Craig Chamberlain 274 pages
ISBN 0-87455-074-2 $24.95 Book/disk combination only

Sidplayer, the feature-packed, popular music player and editor program, is now more versatile and more impressive than before. Enhanced Sidplayer for the Commodore 128 and 64 includes two new versions—one for the Commodore 128 running in 128 mode and another for the Commodore 64. Take advantage of every feature the SID chip (the sound chip in the 128 and 64) has to offer. Just like the original, Enhanced Sidplayer is easy to learn and use, with many powerful new features. The accompanying disk contains the editor, player programs (including a Singalong program), utilities, and sample music that you can enjoy immediately or change. The new Sidplayer plays any songs created by the original Sidplayer for the Commodore 64.

To order COMPUTE! books, write COMPUTE! Books, Customer Service, P.O. Box 5038, F.D.R. Station, New York, NY 10150. Please add $2.00 per book shipping and handling. NC residents add 5 percent sales tax and NY residents add 8.25 percent sales tax. Please allow 4–6 weeks for delivery. COMPUTE! books are available outside the United States from subsidiaries of McGraw-Hill International Book Company.

COMPUTE! Publications, Inc. abc
A Capital Cities/ABC, Inc. Company

Square Logix

See instructions in article on page 30 before typing in.

Program 1: SQRS.OP

```
0B00:A0 A0 E6 E6 E6 A0 A0 E8 BD
0B08:A0 A0 E8 A0 E8 A0 A0 E8 B1
0B10:A0 A0 E8 E8 A0 A0 A0 E8 FB
0B18:A0 A0 A0 E8 A0 A0 E8 A0 43
0B20:A0 E8 E8 A0 E8 E8 E8 A0 45
0B28:A0 A0 DC A0 A0 A0 E6 A0 52
0B30:E6 A0 DC A0 E6 A0 E6 A0 AF
0B38:E6 A0 E6 A0 E6 A0 E6 A0 F8
0B40:E6 A0 E6 A0 E6 A0 E6 A0 01
0B48:E6 A0 A0 A0 DC A0 A0 A0 63
0B50:A0 A0 E6 E6 E6 A0 DC A0 3E
0B58:E6 A0 E6 A0 E6 A0 E6 E6 5F
0B60:E6 A0 E8 E6 DC A0 DC A0 61
0B68:E6 A0 DC A0 A0 A0 DC A0 A1
0B70:DC A0 A0 A0 E6 E6 E6 A0 7C
0B78:A0 A0 A0 A0 E6 A0 E6 A0 4D
0B80:E6 A0 E6 A0 E6 A0 DC A0 2D
0B88:E6 A0 E6 A0 E6 A0 E6 A0 49
0B90:E6 A0 E6 A0 E6 A0 E6 A0 51
0B98:E6 A0 A0 A0 A0 A0 E6 A0 5E
0BA0:A0 A0 E6 E8 E6 A0 A0 E6 7C
0BA8:E8 A0 E6 E8 E6 A0 E6 A0 EE
0BB0:E6 A0 DC A0 E6 A0 E6 E8 78
0BB8:E6 A0 E6 E8 DC A0 E6 A0 AD
0BC0:E6 E8 E6 A0 E6 E8 E6 A0 B4
0BC8:20 20 20 20 20 20 20 20 DE
0BD0:20 20 20 20 20 02 19 20 60
0BD8:0C 05 0F 0E 01 12 04 20 71
0BE0:0D 0F 12 12 09 13 20 20 99
```

Program 2: SQRS.SPR

```
0E00:00 00 00 00 00 00 00 00 1C
0E08:00 00 02 00 00 07 00 00 80
0E10:0F 80 00 1F C0 00 37 60 9A
0E18:00 67 30 00 07 00 00 07 53
0E20:00 00 07 00 00 07 00 00 39
0E28:07 00 00 07 00 00 07 00 46
0E30:00 07 00 00 07 00 00 07 4D
0E38:00 00 00 00 00 00 00 00 54
0E40:00 00 00 00 00 00 00 00 5C
0E48:00 00 00 00 00 00 00 00 64
0E50:06 00 00 03 00 00 01 80 22
0E58:00 00 C0 00 00 60 0F FF 2C
0E60:F0 0F FF F8 0F FF F0 00 A2
0E68:00 60 00 00 C0 00 01 80 25
0E70:00 03 00 00 06 00 00 00 7D
0E78:00 00 00 00 00 00 00 00 94
0E80:00 00 00 00 00 00 00 00 9C
0E88:00 00 07 00 00 07 00 00 A1
0E90:07 00 00 07 00 00 07 00 AE
0E98:00 07 00 00 07 00 00 07 B5
0EA0:00 00 47 10 00 67 30 00 A4
0EA8:37 60 00 1F C0 00 0F 80 0F
0EB0:00 07 00 00 02 00 00 00 9E
0EB8:00 00 00 00 00 00 00 00 D4
0EC0:00 00 00 00 00 00 00 00 DC
0EC8:00 00 00 00 00 00 00 00 E4
0ED0:00 00 00 C0 00 01 80 00 FD
0ED8:03 00 00 06 00 00 0F FF F4
0EE0:F8 1F FF F8 0F FF F8 06 41
0EE8:00 00 03 00 00 01 80 00 6A
0EF0:00 C0 00 00 40 00 00 00 3F
0EF8:00 00 00 00 00 00 00 00 15
0F00:FF FF FE 80 00 02 80 00 0F
0F08:02 80 00 02 80 00 02 80 EF
0F10:00 02 80 00 02 80 00 02 D2
0F18:80 00 02 80 00 02 80 00 C7
0F20:02 80 00 02 80 00 02 80 08
0F28:00 02 80 00 02 80 00 02 EA
0F30:80 00 02 80 00 02 80 00 DF
0F38:02 80 00 02 FF FF FE 00 95
0F40:F0 10 1E C0 38 06 A0 54 1A
0F48:0A 90 92 12 08 10 20 00 C3
0F50:10 00 00 00 00 00 00 00 76
0F58:20 00 04 40 00 02 FC 00 0D
0F60:3F 40 00 02 20 00 04 00 57
0F68:00 00 00 10 00 00 10 00 A7
0F70:08 10 20 90 92 12 A0 54 16
0F78:0A C0 38 06 F0 10 1E 00 37
```

Program 3: Square

```
QD 1 REM COPYRIGHT 1988 COMPUT
     E! PUBLICATIONS, INC. - A
     LL RIGHTS RESERVED
BA 2 PRINT"{CLR}{3 SPACES}COPY
     RIGHT 1988 COMPUTE! PUB.,
      INC.":PRINTTAB(11)"ALL R
     IGHTS RESERVED"
QG 3 BLOAD"SQRS.SPR",B0,P3584
BH 4 REM *** ESTABLISH VARIBLE
     S ***
QF 5 A=0:AA=0:AX=0:B=0:D1=-1:G
     =0:G1=0:H=0:J=0:J1=0:J2=0
     :J3=0:JV=0:K=0:L=0:L1=-1:
     LV=0:M=0:M1=0:N=0:O=0:OX=
     0:OY=0:P=0:R1=-1:SD=0:T=0
     :U1=-1:UU=0:V=0:W=0:WW=0
XK 6 WZ=0:X=0:XU=0:XX=0:YX=0:Y
     =0:YY=0:Z=0:ZZ=0:CO$="{8}
     {GRN}{CYN}{BLU}{RED}{2}":
     FORT=1TO6:C$(T)=MID$(CO$,
     T,1):NEXT:Y$=""
SM 7 P$="{RVS}@@@@@@{OFF}":FOR
     T=0TO5:READC(T):NEXT:II=4
     9176:DIMA$(6,6),X(999),J(
     999),K(999)
AP 8 FORT=0TO3:POKE53287+T,1:P
     OKE53291+T,0:SPRITET+1,0:
     SPRITET+5,0:NEXT
QA 9 WZ=0:V=0:YX=0:J1=1:J2=1:J
     3=4:AX=17:COLOR0,2:COLOR4
     ,1:COLOR6,2
RS 10 ?WINDOW0,0,39,24,1:PRINTT
     AB(9)"{RVS}{BLU}
     {4 SPACES}SQUARE LOGIX
     {5 SPACES}{DOWN}"
EH 11 PRINT" {RVS}{1}SHIFTS
     {OFF}{3 SPACES}{RVS}SHUF
     FLE{OFF}{2 SPACES}{RVS}R
     OTATE 1{OFF}{2 SPACES}
     {RVS}ROTATE 2{DOWN}"
AX 12 PRINT"{2 SPACES}{BLK}"P$
     "{3 SPACES}{RVS}{8}ABCDE
     F{OFF}{4 SPACES}{RVS}
     {BLK}@@{8}@@@@{OFF}
     {3 SPACES}{RVS}{BLK}@@@
     {8}@@@"
AK 13 PRINT"{2 SPACES}{GRN}"P$
     "{3 SPACES}{RVS}GHIJKL
     {OFF}{4 SPACES}{RVS}
     {BLK}@@{GRN}@@@@{OFF}
     {3 SPACES}{RVS}{BLK}@@@
     {GRN}@@@"
EG 14 PRINT"{2 SPACES}{CYN}"P$
     "{3 SPACES}{RVS}MNOPQR
     {OFF}{4 SPACES}"P$"
     {3 SPACES}{RVS}{BLK}@@@
     {CYN}@@@"
BH 15 PRINT"{2 SPACES}{BLU}"P$
     "{3 SPACES}{RVS}STUVWX
     {OFF}{4 SPACES}"P$"
     {3 SPACES}"P$"
FS 16 PRINT"{2 SPACES}{RED}"P$
     "{3 SPACES}{RVS}YZ1234
     {OFF}{4 SPACES}"P$"
     {3 SPACES}"P$"
ER 17 PRINT"{2 SPACES}{2}"P$"
     {3 SPACES}{RVS}56789
     {BLK} {OFF}{4 SPACES}{2}
     "P$"{3 SPACES}"P$"
QJ 18 PRINT"{DOWN}{BLK}
     {2 SPACES}{RVS}GAME 1
     {OFF}{3 SPACES}{RVS}GAME
      2{OFF}{4 SPACES}{RVS}GA
     ME 3{OFF}{3 SPACES}{RVS}
     GAME 4":J1=1:UU=15:SLOW:
     GOSUB26
KK 19 REM ***{2 SPACES}MAKE SE
     LECTION{2 SPACES}***
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How to Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

```
GP 20 WINDOW5,14,39,14,1:PRINT
     "{BLU}PICK GAME.... 1 2
     {SPACE}3 4";:GOSUB23:WZ=
     0:G1=J1:GOSUB35
XS 21 B=G1-2:AX=15:J1=1:J3=9:Z
     =7-G1:ZZ=Z+1:UU=17:GOSUB
     26:SLOW
JX 22 WINDOW0,16,39,16,1:PRINT
     "{BLU}LEVEL OF PLAY{BLK}
     ... 1 2 3 4 5 6 7 8 9 ";
     :GOSUB26:GOSUB23:LV=J1:F
     AST:GOTO27
CF 23 JV=JOY(1):IFJV=0THEN23:E
     LSEIFJV=7THENJ1=J1-1-(J1
     =J2):GOSUB26:GOTO23
RJ 24 IFJV=3THENJ1=J1+1+(J1=J3
     ):GOSUB26:GOTO23:ELSEIFJ
     V>127THENSOUND1,400,1:RE
     TURN
DD 25 GOTO23
DG 26 XU=AX+2*J1:SOUND1,J1*100
     0,10:WINDOW0,UU,39,UU,1:
     PRINTTAB(XU)"{RED}↑";:RE
     TURN
DS 27 J=RND(-TI):M1=0:IFG1<3TH
     ENZZ=6
SD 28 REM ***{2 SPACES}RANDOML
     Y MIX BLOCKS{2 SPACES}**
     *
DX 29 DO:M1=M1+1:J=INT(RND(1)*
     Z?Z):K=INT(RND(1)*ZZ):GOS
     UB33:SOUND2,8000,1:ONG1G
     OSUB30,30,31,31:LOOPUNTI
     LM1=LV*3:J=2:K=2:WZ=1:GO
     SUB35:TI$="000000":GOTO5
     0
CG 30 X=INT(RND(1)*4+1):GOSUB3
     2:GOSUB71:RETURN
KX 31 X=INT(RND(1)*2):X(M1)=-(
     X=0):GOSUB33:GOSUB82:RET
     URN
MK 32 X(M1)=X+2+(X>2)*4:RETURN
EE 33 J(M1)=J:K(M1)=K:RETURN
PM 34 REM ***{2 SPACES}PRINT B
     LOCKS TO SCREEN
     {2 SPACES}***
HH 35 FAST:WINDOW0,0,39,24,WZ:
     AA=0:FORY=0TO5:FORX=0TO5
     :IFWZ=1THEN42
BE 36 AA=AA+1:IFG1<>2THENAA$="
     ":GOTO39
CQ 37 IFAA<27THENAA$=CHR$(64+A
     A):GOTO39:ELSEIFAA<36THE
     NAA$=CHR$(22+AA)
SE 38 IFAA=36THENA$(X,Y)="
     {RVS}{BLK}{2 SPACES}{M}
     {DOWN}{3 LEFT}{2 SPACES}
      {M}{DOWN}{3 LEFT}{2 P}@"
     :GOTO41
HM 39 ZZ$=" {M}{DOWN}{3 LEFT}
     {2 SPACES}{M}{DOWN}
     {3 LEFT}{2 P}@{OFF}"
SX 40 A$(X,Y)="{RVS}"+C$(INT((
     AA-1)/6)+1)+AA$+ZZ$
GX 41 B$(X,Y)=A$(X,Y):NEXTX,Y:
     SLOW:RETURN
EQ 42 SYSII,0,Y*3,X*3:PRINTA$(
     X,Y);:SOUND1,10000,1:NEX
     TX,Y
DJ 43 WINDOW18,0,20,24:PRINT"
     {OFF}{BLK}{*}{RVS}
     {2 SPACES}{RIGHT}
     {2 SPACES}{RIGHT}
     {2 SPACES}";:FORT=1TO5:P
```

```
      RINT"{*}{2 SPACES}
      {RIGHT}{2 SPACES}{RIGHT}
      {2 SPACES}";:NEXT
GQ 44 WINDOW0,18,21,22:PRINT"
      {RVS}{*}{2 RIGHT}{OFF}
      {*}{2 RIGHT}{*}{2 RIGHT}
      {*}{2 RIGHT}{*}{2 RIGHT}
      {*}{2 RIGHT}M{RVS}
      {2 SPACES}":FORT=1TO2:PR
      INT"{RVS}{21 SPACES}":NE
      XT:WINDOW0,0,39,24
GK 45 IFG1=3THENOX=24:OY=52:SD
      =5:ELSEIFG1=4THENOX=36:O
      Y=64:SD=6
HQ 46 SLOW:RETURN
GG 47 REM *** MARKERS ***
BQ 48 MOVSPRX,J*24+24,K*24+50:
      POKE53269,2↑(X-1):SOUND1
      ,4000,1:RETURN
GR 49 SPRITESD,1,1,0,1,1:MOVSP
      RSD,J*24+OX,K*24+OY:SOUN
      D1,(J+K*5+1)*1000,1:RETU
      RN
BE 50 SLOW:GOSUB101:IFG1<3THEN
      X=1:GOSUB47:GOTO52:ELSEG
      OSUB49:GOTO52
BJ 51 M1=M1+1:J(M1)=J:K(M1)=K:
      IFG1<3THENX(M1)=X+2+(X>2
      )*4:ELSEX(M1)=-(X=0)
AS 52 GOSUB116:IFV=1THEN96
QH 53 GETK$:IFK$="Q"THENFORI=1
      TO8:SPRITEI,0:NEXT:PRINT
      "{CLR}":COLOR0,1:COLOR5,
      14:COLOR4,14:END:ELSEIFK
      $="*"THENGOSUB118
JD 54 REM *** JOYSTICK CONTROL
      S ***
JF 55 JV=JOY(1):IFJV=0THEN52:E
      LSEIFG1>2THEN58
BC 56 IFJV=1THENX=1:GOTO62:ELS
      EIFJV=3THENX=2:GOTO64:EL
      SEIFJV=5THENX=3:GOTO66:E
      LSEIFJV=7THENX=4:GOTO68:
      ELSEIFJV=128THENGOSUB71:
      GOSUB80:GOTO51
HG 57 GOTO52
FG 58 IFJV=1THENK=K-1-(K=0):GO
      TO61:ELSEIFJV=3THENJ=J+1
      +(J=Z):GOTO61:ELSEIFJV=5
      THENK=K+1+(K=Z):GOTO61:E
      LSEIFJV=7THENJ=J-1-(J=0)
      :GOTO61
HK 59 IFG1>2AND(JV=131ORJV=135
      )THENYX=YX+1:GOSUB81:GOS
      UB80:GOTO51
RG 60 GOTO52
PS 61 GOSUB49:GOTO52
EA 62 U1=U1+1:R1=-1:D1=-1:L1=-
      1:IFU1>0THENK=K-1-(K=0)
FM 63 GOTO69
GE 64 R1=R1+1:U1=-1:L1=-$1:D1=-
      1:IFR1>0THENJ=J+1+(J=5)
PP 65 GOTO69
CD 66 D1=D1+1:L1=-1:U1=-1:R1=-
      1:IFD1>0THENK=K+1+(K=5)
BP 67 GOTO69
BJ 68 L1=L1+1:U1=-1:R1=-1:D1=-
      1:IFL1>0THENJ=J-1-(J=0)
DC 69 GOSUB48:GOTO55
XH 70 REM *** SHIFT AND ROTATE
       ROUTINES ***
CD 71 ONXGOTO72,74,76,78
KJ 72 A$=A$(J,0):FORT=0TO4:A$(
      J,T)=A$(J,T+1):NEXT:A$(J
      ,5)=A$:IFWZ=0THENRETURN
QC 73 FORT=5TO0STEP-1:SYSII,0,
      T*3,J*3:PRINTA$(J,T):NEX
      T:RETURN
JS 74 A$=A$(5,K):FORT=5TO1STEP
      -1:A$(T,K)=A$(T-1,K):NEX
      T:A$(0,K)=A$:IFWZ=0THENR
      ETURN
GB 75 FORT=0TO5:SYSII,0,K*3,T*
      3:PRINTA$(T,K):NEXT:RETU
      RN
RB 76 A$=A$(J,5):FORT=5TO1STEP
      -1:A$(J,T)=A$(J,T-1):NEX
      T:A$(J,0)=A$:IFWZ=0THENR
      ETURN
AE 77 FORT=0TO5:SYSII,0,T*3,J*
      3:PRINTA$(J,T):NEXT:RETU
      RN
KJ 78 A$=A$(0,K):FORT=0TO4:A$(
      T,K)=A$(T+1,K):NEXT:A$(5
      ,K)=A$:IFWZ=0THENRETURN
BK 79 FORT=5TO0STEP-1:SYSII,0,
      K*3,T*3:PRINTA$(T,K):NEX
      T:RETURN
CR 80 SOUND1,(X+1)*2000,1:GOSU
      B92:GOSUB115:RETURN
JR 81 IFJV=135THENX=1:ELSEX=0
SD 82 L=J+1:O=K+1:IFG1=4THEN86
      :ELSEIFX=1THEN84
JP 83 A$=A$(J,K):A$(J,K)=A$(J,
      O):A$(J,O)=A$(L,O):A$(L,
      O)=A$(L,K):A$(L,K)=A$:GO
      TO85
EA 84 A$=A$(J,K):A$(J,K)=A$(L,
      K):A$(L,K)=A$(L,O):A$(L,
      O)=A$(J,O):A$(J,O)=A$
EJ 85 IFWZ=0THENRETURN:ELSEFOR
      H=KTOK+B:FORG=JTOJ+B:SYS
      II,0,H*3,G*3:PRINTA$(G,H
      ):NEXTG,H:RETURN
CB 86 M=J+2:P=K+2:IFX=1THEN89
RC 87 A$=A$(J,K):A$(J,K)=A$(J,
      O):A$(J,O)=A$(J,P):A$(J,
      P)=A$(L,P):A$(L,P)=A$(M,
      P)
SH 88 A$(M,P)=A$(M,O):A$(M,O)=
      A$(M,K):A$(M,K)=A$(L,K):
      A$(L,K)=A$:GOTO85
MH 89 A$=A$(J,K):A$(J,K)=A$(L,
      K):A$(L,K)=A$(M,K):A$(M,
      K)=A$(M,O):A$(M,O)=A$(M,
      P)
EB 90 A$(M,P)=A$(L,P):A$(L,P)=
      A$(J,P):A$(J,P)=A$(J,O):
      A$(J,O)=A$:GOTO85
KK 91 REM *** CHECK FOR WIN **
      *
CD 92 V=1:FORXX=0TO5:FORYY=0TO
      5
QQ 93 IFA$(XX,YY)<>B$(XX,YY)TH
      ENV=0:YY=5:XX=5:GOTO94
SE 94 NEXTYY,XX:RETURN
BQ 95 REM *** YES, COMPLETED.
      {SPACE}NEW GAME ***
RK 96 WINDOW0,22,39,24,1:PRINT
      "{WHT}YOU HAVE COMPLETE
      {SPACE}GAME"G1"AT LEVEL"
      LV"
AE 97 PRINT"{4 SPACES}{RVS}
      {2 SPACES}PRESS
      {2 SPACES}FIRE{2 SPACES}
      BUTTON{2 SPACES}TO
      {2 SPACES}START {OFF}";:
      A=0:
EF 98 JV=JOY(1):IFJV>127THENGO
      TO8
XJ 99 A=A+1+(A=5)*6:COLOR0,C(A
      ):W=W+1+(W>200)*200:SOUN
      D1,W*300+300,2:GOTO98
FD 100 REM *** PRINT TITLE AND
       PATTERN ***
EQ 101 WINDOW23,0,39,24,1:IFG1
       =1THENPRINT"{RVS}{BLK}
       {SPACE}S H I F T S
       {2 DOWN}"
RP 102 IFG1=2THENPRINT"{RVS}
       {BLK} S H U F F L E
       {2 DOWN}"
CR 103 IFG1=3THENPRINT"{RVS}
       {BLK} R O T A T E 1
       {2 DOWN}":SD=5
GP 104 IFG1=4THENPRINT"{RVS}
       {BLK} R O T A T E 2
       {2 DOWN}":SD=6
AP 105 PRINT"PATTERN TO MATCH"
       :WINDOW26,5,39,24:IFG1=
       2THEN107
QA 106 FORR=1TO6:PRINTC$(R)"
       {RVS}"P$:NEXT:GOTO111
FE 107 AK=0:FORAA=1TO6:PRINT:F
       ORBB=0TO5:AK=AK+1
FS 108 IFAK<27THENPRINT"{RVS}"
       C$(AA)CHR$(64+AK);:GOTO
       110:ELSEIFAK=36THENPRIN
       T"{RVS}{BLK} ";:GOTO110
SF 109 PRINT"{RVS}"C$(AA)CHR$(
       22+AK);
KH 110 NEXTBB,AA:GOTO111
FK 111 WINDOW0,0,39,24
AA 112 REM *** COMPUTER SOLVES
        ***
KP 113 SYSII,0,22,0:PRINT"
       {OFF}{RED}HIT {RVS}Q
       {OFF} TO QUIT. {RVS}*
       {OFF} FOR COMPUTER SOLU
       TION, {PUR}THEN PRESS A
       NY KEY TO RESUME YOUR G
       AME."
KK 114 WINDOW0,0,39,24
KJ 115 SYSII,0,17,24:PRINT"
       {OFF}{BLK}TURN #"YX+1"
       {2 SPACES}":RETURN
RB 116 SYSII,0,13,26:PRINT"{3}
       TIMER"
HQ 117 PRINTTAB(25)"{RVS}{BLU}
       "LEFT$(TI$,2)":"MID$(TI
       $,3,2)":"RIGHT$(TI$,2):
       RETURN
FE 118 IFG1>2THEN125
XH 119 WW=1:W=M1:DO:X=X(W):GOS
       UB121:W=W-1:LOOPUNTILW<
       1:GETKEYY$:FAST
RB 120 WW=-1:W=1:DO:X=X(W)+2+(
       X(W)>2)*4:GOSUB121:W=W+
       1:LOOPUNTILW>M1:SLOW:RE
       TURN
GP 121 J=J(W):K=K(W):SD=X-1
BS 122 GOSUB48:IFWW>0THENGOSUB
       124
MB 123 GOSUB71:RETURN
SA 124 SLEEP1:SOUND2,4000,1:RE
       TURN
BS 125 WW=1:FORW=M1TO1STEP-1:X
       =X(W):GOSUB127:NEXT:GET
       KEYY$:FAST
BK 126 WW=-1:FORW=1TOM1:X=-(X(
       W)=0):GOSUB127:NEXT:SLO
       W:RETURN
BJ 127 J=J(W):K=K(W):SD=G1+2:G
       OSUB49:IFWW>0THENGOSUB1
       24
BH 128 GOSUB82:RETURN
MG 129 DATA16,6,4,7,3,10
```

3-D Bar Grapher for the 128

Article on page 67.

```
HE 10 REM COPYRIGHT 1988 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED
MQ 20 PRINT"{CLR}{3 SPACES}COP
      YRIGHT 1988 COMPUTE! PUB
      ., INC.":PRINTTAB(11)"AL
      L RIGHTS RESERVED":SLEEP
      3
XB 30 DIMV1(441),V(21,21):GRAP
      HIC3,1
FX 40 GRAPHIC0,1:COLOR0,16:COL
      OR4,7:PRINT"{BLK}
```

```
      {12 SPACES}3-D BAR GRAPH
      ER"
HE 50 PRINT"{2 DOWN}{BLK}{RVS}
      LOAD A GRAPH FROM DISK?
      {SPACE}(Y/N)"
DQ 60 INPUT"{2 SPACES}N
      {3 LEFT}";LG$:IFLG$="Y"T
      HEN670
GG 70 PRINT"{RVS}VIEW PREVIOUS
       GRAPH IN MEMORY? (Y/N)"
ED 80 INPUT"{2 SPACES}N
      {3 LEFT}";V$:IFV$="Y"THE
      NGOSUB710
QA 90 PRINT"{RVS}ENTER TITLE O
      F GRAPH (0-40 CHARACTERS
      )"
MR 100 INPUTT$:IFLEN(T$)>39THE
      NPRINT:T$="":GOTO100
SP 110 PRINT"{RVS}ENTER VALUE
      {SPACE}REPRESENTATION (
      0-15 CHARS.)"
EB 120 INPUTR$:IFLEN(R$)>15THE
      NPRINT"{2 UP}":R$="":GO
      TO120
CS 130 PRINT"{RVS}ENTER STARTI
      NG YEAR{21 SPACES}2 DIG
      IT REPRESENTATION)
GF 140 INPUTSY:IFSY=0THENPRINT
      "{2 UP}":GOTO140
JF 150 PRINT"{RVS}ENTER ENDING
       YEAR (0-20 YEAR SPAN)
FH 160 INPUT"{5 SPACES}
      {5 LEFT}";EY:IFEY<SYTHE
      NEY=EY+100
DA 170 IFEY>SY+20THENPRINT"
      {2 UP}":GOTO160
BQ 180 IFEY=SYTHENGOSUB720
KP 190 PRINT"{RVS}ENTER NUMBER
       OF ITEMS TO GRAPH (1-2
      0)
CS 200 INPUT"{5 SPACES}
      {5 LEFT}{2 SPACES}5
      {3 LEFT}";IT:IFIT<1ORIT
      >20THENPRINT"{2 UP}":GO
      TO200
PP 210 PRINT"{RVS}GRAPH FROM (
      0-99999)"
RH 220 INPUT"{5 SPACES}
      {5 LEFT}{2 SPACES}0
      {5 SPACES}{8 LEFT}";S:I
      FS>99999THENPRINT"
      {2 UP}":GOTO220
DX 230 PRINT"{RVS}TO{9 SPACES}
      (0-99999)"
DD 240 INPUTE:IFE<=SORE>99999T
      HENPRINT"{2 UP}":GOTO24
      0
XA 250 GOSUB820
RD 260 PRINT"{RVS}ENTER VALUES
      ":TM$="YEAR":IFFL=1THEN
      TM$="MONTH"
MP 270 FORA=1TOEY-SY+1-FL:FORB
      =1TOIT
MQ 280 PRINTTM$;A",ITEM"B;:INP
      UTV(A,B):IFV(A,B)<SORV(
      A,B)>ETHENPRINT"{2 UP}"
      :GOTO280
GG 290 NEXTB,A
HJ 300 PRINT"{RVS}ENTER KEY (0
      -40 CHARACTERS)"
KC 310 INPUTK$:IFLEN(K$)>40THE
      NPRINT:K$="":GOTO300
CC 320 BD$="":INPUT"{RVS}BORDE
      R? (Y/N){OFF}{2 SPACES}
      N{3 LEFT}";BD$
QX 330 INPUT"{RVS}FAST? (Y/N)
      {OFF}{2 SPACES}N
      {3 LEFT}";F$:IFF$="Y"TH
      ENFAST
DQ 340 T1=12:GOSUB870:SL=INT(4
      9/(EY-SY+1-FL)):SI=INT(
      49/IT)
RK 350 DRAW3,79,18TO79,82TO79-
      (EY-SY+1-FL)*SL,82+(EY-
      SY+1-FL)*SLTO79-(EY-SY+
      1-FL)*SL,18+(EY-SY+1-FL
      )*SLTO79,18TO79+IT*SI,1
      8+IT*SITO79+IT*SI,82+IT
      *SITO79,82:B=0
HJ 360 FORA=18+(EY-SY+1-FL)*SL
      TO82+(EY-SY+1-FL)*SLSTE
      P8:DRAW3,79-(EY-SY+1-FL
      )*SL,ATO79,18+8*BTO79+I
      T*SI,18+8*B+IT*SI:B=B+1
      :NEXT
JG 370 SP=INT(49/(EY-SY+1-FL))
      :Y=19+(EY-SY+1-FL)*SL:D
      =79-(EY-SY+1-FL)*SL:FOR
      A=DTO79STEPSP:DRAW3,A,Y
      TOA,Y+63:Y=Y-SP:NEXT
RD 380 SK=INT(49/IT):Y=18:D=79
      :L=Y:M=D:FORA=DTO79+IT*
      SKSTEPSK:DRAW3,A,YTOA,Y
      +64:Y=Y+SK:NEXT
AD 390 SE=E/8:Y=16:O=50:Q=-1:C
      OLOR3,2:FORA=0TOESTEPSE
      :N1$=STR$(INT(A))+"=":N
      M$=STR$(INT(A)):N2$="="
      +RIGHT$(NM$,LEN(NM$)-1)
      :X=8-LEN(N1$)-1:CHAR3,X
      ,Y,N1$
FF 400 CHAR3,33,Y,N2$:Y=Y-1:IF
      X<OTHENP=X:O=X
HA 410 IFQ<LEN(N2$)THENR=LEN(N
      2$):Q=R
AP 420 NEXT
GG 430 SC=(40-LEN(T$))/2:COLOR
      3,5:CHAR3,SC,1,T$,1
DC 440 COLOR3,8:Y=8:FORA=1TOLE
      N(R$):R2$=MID$(R$,A,1):
      CHAR3,P,Y,R2$,1:CHAR3,R
      +33,Y,R2$,1:Y=Y+1:NEXT
PS 450 COLOR3,9:IFFL=1THENCHAR
      3,21,22,Y1$:CHAR3,31,17
      ,Y2$:CHAR3,27,22,"MONTH
      S":GOTO480
AF 460 Y1$=STR$(SY):Y2$=STR$(E
      Y):IFEY>99THENY2$=STR$(
      EY-100)
KQ 470 CHAR3,20,22,Y1$:CHAR3,3
      1,17,Y2$:CHAR3,27,22,"Y
      EARS"
CK 480 COLOR3,10:I2$=STR$(IT):
      CHAR3,7,17,"1":CHAR3,16
      ,22,I2$:CHAR3,7,22,"ITE
      MS"
PJ 490 SC=(40-LEN(K$))/2:COLOR
      3,11:CHAR3,SC,24,K$:COL
      OR3,C3
GE 500 IFBD$="Y"THENCOLOR3,8:B
      OX3,0,0,159,199:COLOR3,
      C3
MC 510 X2=80:Y2=81+SP:X3=X2:Y3
      =Y2:Y4=81+SK:Y5=Y4:FORA
      =EY-SY+1-FLTO1STEP-1:FO
      RC=1TOIT:V1(C)=V(A,C):N
      EXTC:FORB=1TOIT:X=X2-SP
      :Y=Y2:F=(E-S)/64:G=0:H=
      X+SK-1:I=Y+SK-1
RQ 520 DRAW3,X,YTOX+SK-1,Y+SK-
      1:Y=Y-1:G=G+F:IFG>=V1(B
      )THEN530:ELSE520
KR 530 J=X:K=Y:DRAW1,H,ITOH,Y+
      SK:X=X2+SK-2:Y=Y4:G=0:H
      =X:I=Y
DQ 540 DRAW1,X,YTOX-SP+2,Y+SP-
      2:Y=Y-1:G=G+F:IFG>=V1(B
      )THEN550:ELSE540
CP 550 DRAW3,H,ITOH,Y+1:X=J:Y=
      K:G=0:L=X+SP-1:M=Y-SP+1
BA 560 DRAW2,X,YTOX+SP-1,Y-SP+
      1TOX+SP-1,Y-SP+2TOX,Y+1
      :X=X+1:Y=Y+1:G=G+1:IFG>
      =SK-1THEN570:ELSE560
GP 570 DRAW2,X,YTOX+SP-1,Y-SP+
      1:DRAW1,J,KTOL,MTOX+SP-
      1,Y-SP+1:X2=X2+SK:Y2=Y2
      +SK:Y4=Y4+SK:NEXTB:X2=X
      3-SP:Y2=Y3+SP:Y4=Y5+SP:
      X3=X2:Y3=Y2:Y5=Y4:NEXTA
QR 580 SLOW:COLOR4,1:POKE208,0
      :GETKEYA$:GRAPHIC0,1:CO
      LOR0,16:COLOR4,7
DJ 590 PRINT"{2 DOWN}{BLK}
      {RVS}SAVE GRAPH TO DISK
       (Y/N/Q)?{OFF} {RVS}
      {OFF}{LEFT}";
CH 600 GETKEYB$
MS 610 IFB$="Y"THENPRINT"YES
      {RVS} {OFF}":SLEEP1:GOT
      O650
BS 620 IFB$="N"THENPRINT"NO
      {RVS} {OFF}":SLEEP1:GOT
      O40
CP 630 IFB$="Q"THENEND
KP 640 GOTO600
QX 650 GOSUB880
DD 660 FAST:BSAVE(SG$),B0,P819
      2TOP16383:SLOW:GOTO900
HK 670 GOSUB880:GOSUB820
HF 680 DOPEN#1,(SG$):IFDS<>0TH
      ENGOSUB810:CLOSE1:GOTO6
      70:ELSECLOSE1
KA 690 T1=1:GOSUB870:FAST:BLOA
      D(SG$),B0,P8192:SLOW
JC 700 GRAPHIC3:POKE208,0:GETK
      EYB$:GOTO40
PG 710 GRAPHIC3:COLOR0,1:COLOR
      4,1:POKE208,0:GETKEYB$:
      GRAPHIC0:COLOR0,16:COLO
      R4,7:RETURN
AE 720 INPUT"{RVS}STARTING MON
      TH? (1-12){OFF}
      {2 SPACES}1{3 LEFT}";M1
      :IFM1<1ORM1>12THENPRINT
      "{2 UP}":GOTO720
XH 730 M2=(M1+12)-13:IFM2=0THE
      NM2=12
BP 740 PRINT"{RVS}ENDING MONTH
      ? (1-12){OFF}{2 SPACES}
      "M2;:INPUT"{5 LEFT}";M3
      :IFM3<1ORM3>12THENPRINT
      "{2 UP}":GOTO740
QB 750 M$="JANFEBMARAPRMAYJUNJ
      ULAUGSEPOCTNOVDEC":Y1$=
      MID$(M$,M1*3-2,3):Y2$=M
      ID$(M$,M3*3-2,3):SY=0:E
      Y=(12-M1)-(12-M3)+1:IFE
      Y<=0THENEY=EY+12
SQ 760 FL=1:RETURN
SJ 770 PRINT"{DOWN}{RVS}NEED T
      O SEE THE DIRECTORY FIR
      ST? (Y/N)"
QQ 780 INPUT"{2 SPACES}Y
      {3 LEFT}";D$:IFD$="N"TH
      ENRETURN:ELSEIFD$<>"Y"T
      HEN770:ELSEPRINT"{CLR}"
FH 790 DIRECTORY:IFDS<>0THENGO
      SUB810:GOTO790
BM 800 GETKEYA$:PRINT"{CLR}":R
      ETURN
DR 810 PRINT"{DOWN}"DS$:GETKEY
      A$:PRINT"{CLR}":RETURN
XH 820 PRINT"{RVS}ENTER THREE
      {SPACE}COLORS"
PB 830 INPUT"COLOR 1{2 SPACES}
      15{4 LEFT}";C1:IFC1<1OR
      C1>16THENPRINT"{2 UP}":
      GOTO830
MJ 840 INPUT"COLOR 2{2 SPACES}
      4{3 LEFT}";C2:IFC2<1ORC
      2>16THENPRINT"{2 UP}":G
      OTO840
QK 850 INPUT"COLOR 3{2 SPACES}
      7{3 LEFT}";C3:IFC3<1ORC
      3>16THENPRINT"{2 UP}":G
      OTO850
MR 860 RETURN
SQ 870 COLOR0,1:COLOR4,T1:COLO
```

```
       R1,C1:COLOR2,C2:COLOR3,
       C3:GRAPHIC3,1:RETURN
EP 880 GOSUB770:PRINT"{RVS}ENT
       ER NAME OF GRAPH (1-16
       {SPACE}CHRS)"
GM 890 INPUTSG$:IFLEN(SG$)<1OR
       LEN(SG$)>16THENPRINT"
       {2 UP}":GOTO890:ELSERET
       URN
KG 900 IFDS<>0THENGOSUB810:GOT
       O650:ELSE40
```

Eight Thousand Dragons

See instructions in article on page 59 before typing in.

```
0801:0B 08 01 00 9E 32 30 36 0D
0809:31 00 00 00 AD 8A 09 8D E8
0811:20 D0 A9 01 A2 08 9D B1 CC
0819:09 0A CA D0 F9 A9 FF 8D 9A
0821:0F D4 A9 80 8D 12 D4 8D 17
0829:18 D4 A0 00 AD 8B 09 0A 46
0831:0A 0A 0A 0D 8A 09 99 00 86
0839:04 99 00 05 99 00 06 99 74
0841:00 07 C8 D0 F1 A9 00 A2 12
0849:0F 9D 93 09 CA D0 FA A9 84
0851:18 8D 18 D0 AD 11 D0 09 3D
0859:20 8D 11 D0 A9 00 85 FB 60
0861:A2 20 86 FC A0 00 91 FB 8F
0869:C8 D0 FB E6 FC CA D0 F4 A9
0871:A9 00 A0 0E 99 A3 09 88 41
0879:C0 FF D0 F8 A9 60 85 FD 6B
0881:A9 84 85 FE A9 64 85 FB 0E
0889:A9 34 85 FC A0 00 A9 80 D4
0891:91 FB A0 00 A2 00 18 BD 80
0899:95 09 7D A3 09 7D A4 09 31
08A1:29 01 D0 04 88 4C AA 08 B3
08A9:C8 E8 E0 0E D0 E8 98 29 D9
08B1:07 A8 B9 8C 09 8D C0 08 77
08B9:B9 8D 09 8D C1 08 4C FF CA
08C1:FF E6 FD A5 FD 29 07 AA F2
08C9:D0 0D A5 FB 18 69 08 85 F5
08D1:FB A5 FC 69 00 85 FC 4C DB
08D9:42 09 E6 FE A5 FD 29 07 98
08E1:AA A5 FE 29 07 D0 10 E6 A5
08E9:FC A5 FB 18 69 39 85 FB 1A
08F1:90 02 E6 FC 4C 42 09 E6 DB
08F9:FB F0 F7 4C 42 09 C6 FD C9
0901:A5 FD 29 07 AA C9 07 D0 56
0909:38 A5 FB 38 E9 08 85 FB 1A
0911:A5 FC E9 00 85 FC 4C 42 6D
0919:09 C6 FE A5 FD 29 07 AA E8
0921:A5 FE 29 07 C9 07 D0 10 77
0929:C6 FC A5 FB 38 E9 39 85 B3
0931:FB B0 0E C6 FC 4C 42 09 42
0939:A5 FB 38 E9 01 85 FB 90 69
0941:F2 A0 00 B1 FB 1D B2 09 D2
0949:91 FB EE B1 09 A2 0E BD C8
0951:A3 09 C9 02 D0 0B A9 00 D6
0959:9D A3 09 FE A2 09 CA D0 D3
0961:EE AD A3 09 D0 03 4C 93 1A
0969:08 20 E4 FF C9 00 F0 F9 4E
0971:C9 51 F0 12 A0 02 AD 1B 7F
0979:D4 29 01 99 94 09 C8 C0 15
0981:0F D0 F3 4C 5D 08 4C 18 4E
0989:E5 00 08 C2 08 DB 08 FF 7B
0991:08 1A 09 00 00 00 00 00 4F
```

Excelfont 80

See instructions in article on page 56 before typing in.

Program 1: EXCEL.LDR

```
HE 10 REM COPYRIGHT 1988 COMPU
      TE! PUBLICATIONS, INC. -
      ALL RIGHTS RESERVED
PD 20 GRAPHIC1,1:GRAPHIC0,1:FA
      ST:POKE2606,8:POKE2607,2
      4:GRAPHIC5,1:SYS52684,8,
      12:SYS52684,24,20:SYS526
      84,96,34:COLOR6,15
XF 30 PRINT"{WHT}{5 DOWN}"TAB(
      10)"{A}CCCCCCCCCCCCCCCCC
      CCCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCCCCCCCCCCCC{S}"
FQ 40 FORI=.TO2:PRINTTAB(10)"B
      "TAB(69)"B":NEXT
CQ 50 PRINTTAB(10)"B"TAB(34)"E
      XCELFONT 80"TAB(69)"B"
QS 60 PRINTTAB(10)"B"TAB(69)"B
      "
DD 70 PRINTTAB(10)"B"TAB(26)"(
      C) 1988 COMPUTE! PUB., I
      NC."TAB(69)"B"
XG 80 PRINTTAB(10)"B"TAB(30)"A
      LL RIGHTS RESERVED"TAB(6
      9)"B"
RQ 90 PRINTTAB(10)"B"TAB(69)"B
      "
KR 100 FORI=.TO2:PRINTTAB(10)"
      B"TAB(69)"B":NEXT
MQ 110 PRINTTAB(10)"{Z}CCCCCCC
      CCCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCCCCCCCCCCCCCCCCCCC
      CCCCC{X}":SYS52684,,,34
KA 120 CHAR1,33,16,"LOADING
      {2 SPACES}ML...":BLOAD"
      EXCEL.OBJ":BLOAD"EXCEL.
      OBJ1"
JR 130 CHAR1,33,16,"SETTING
      {2 SPACES}UP...":GOSUB1
      50
JA 140 CHAR1,28,16,"{WHT}LOADI
      NG MAIN PROGRAM...":CLR
      :RUN"EXCEL.BAS"
FH 150 POKE2606,.:POKE2607,16:
      PRINT"{CLR}"
MR 160 PRINTTAB(34)"{B}{WHT}EX
      CELFONT 80"
QS 170 PRINT"{CYN}{3 SPACES}
      {B}12345678"CHR$(130)"
      {2 SPACES}{YEL}{A}CCCCC
      CCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCCCCCCCC{S}"
EB 180 FORI=1TO4:PRINT"{CYN}"S
      TR$(I)"{M}"SPC(8)"{G}
      {YEL}B"SPC(64)"B":NEXT
BC 190 PRINT"{CYN} 5{M}"SPC(8)
      "{G} {YEL}{Z}CCCCCCCCCC
      CCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCCC{X}"
AJ 200 PRINT"{CYN} 6{M}"SPC(8)
      "{G} {WHT}{A}CCCCCCCCCC
      CCCCCCCCCCCCCCCCHELP ME
      NUCCCCCCCCCCCCCCCCCCCCC
      CCCCCCCC{S}"
MC 210 FORI=7TO9:PRINT"{CYN}"S
      TR$(I)"{M}"SPC(8)"{G}
      {WHT}B"SPC(64)"B":NEXT
DM 220 FORI=10TO16:PRINT"{CYN}
      {LEFT}"STR$(I)"{M}"SPC(
      8)"{G} {WHT}B"SPC(64)"B
      ":NEXT
JR 230 PRINT"{CYN}{3 SPACES}
      {8 T}{2 SPACES}{WHT}{Z}
      CCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCCCCCCCCCCCC{X}"
JR 240 PRINT"{6}{A}CCCCCCCCCC
      {S} {PUR}{A}CCCCCCCCCCC
      CCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCC{S}"
KG 250 PRINT"{6}B WRAP
      {2 SPACES}ON B {PUR}B"S
      PC(64)"B"
SB 260 PRINT"{6}B{3 SPACES}WHO
      LE{2 SPACES}B {PUR}B"SP
      C(64)"B"
MH 270 PRINT"{6}B SIZE
      {5 SPACES}B {PUR}B"SPC(
      64)"B"
JJ 280 PRINT"{6}B CHRSET
      {3 SPACES}B {PUR}B"SPC(
      64)"B"{53 SPACES}"
AF 290 PRINT"{6}{Z}CCCCCCCCCC
      {X} {PUR}{Z}CCCCCCCCCCC
      CCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCCCCCCCCCCCCCCCCCC
      CCCCCCC{X}";
SP 300 POKE2606,8:POKE2607,24:
      SYS4864:RETURN
```

Program 2: EXCEL.BAS.

```
BS 10 TRAP1020:BANK15:MA$="
      {UP}{RIGHT}{DOWN}{LEFT}D
      SLYGHB8462WPRR{RVS}FM
      {CLR}N)OON{HOME}QTEC{A}"
      :SYS24812,,9,,,CHR$(1)
RJ 20 FORI=.TO48:SYS3072,34,I:
      SYS3072,35,96-I:NEXT
JR 30 SYS3072,12,0:SYS3072,13,
      0:SYS3072,20,16:POKE2606
      ,0:POKE2607,16:COLOR6,1:
      SLEEP1
QP 40 FORI=.TO48:SYS3072,34,48
      -I:SYS3072,35,48+I:NEXT
RJ 50 FORI=1TO8:READX(I),Y(I):
      NEXT
KR 60 IFPA<>.THENSYS3114,PA/25
      6,PAAND255,7:SYS3114,CA/
      256,CAAND255,141
JC 70 WINDOW14,20,77,23,1:PRIN
      TCHR$(142)"{WHT}(U)PPERC
      ASE OR (L)OWERCASE?":GET
      KEYA$:IFA$="U"THENCC=.:I
      =208:ELSEIFA$="L"THENCC=
      1:I=216:ELSE70
GB 80 INPUT"# OF EDITING ROWS(
      1-16)";R:R=R-1:IFR<.ORR>
      15THEN80
CJ 90 WINDOW1,20,10,23:CHAR1,7
      ,3,CHR$(153)+STR$(CC)
ER 100 IFR<10THENA$=" ":ELSEA$
      =""
SB 110 A$=A$+STR$(R):CHAR1,5,2
      ,A$
PA 120 BANK14:SYS3890,I:BANK15
      :SYS3784
BR 130 CX=.:CY=.:SYS3254,48,0:
      SYS3289:X=.:Y=.:PA=4259
      :SYS3114,16,174,181:CA=
      4270:SYS3114,16,163,59:
      AH=48:AL=.:W=1
BK 140 SYS3158,AH,AL:SYS3289
RF 150 WINDOW14,20,77,23,1
DC 160 J=JOY(2):IFJ=.THENB=.:G
      OTO260
RG 170 IFJ>127THEN230
HD 180 B=.
BK 190 SYS3114,PA/256,PAAND255
      ,15:X=X+X(J):Y=Y+Y(J)
ED 200 IF(X<.)OR(X>7)THENX=X-X
      (J)
HC 210 IF(Y<.)OR(Y>15)THENY=Y-
      Y(J)
MP 220 PA=Y*80+X+4259:SYS3114,
      PA/256,PAAND255,59:GOTO
      260
CX 230 J=JANDJ15:IFB=1THEN250
PA 240 B=1:SYS3125,(PA-4096)/2
      56,(PA-4096)AND255:RREG
      ,,S:IFS>32THENS=.:ELSES
      =1
JD 250 SYS3220,8-X,Y,S:SYS3158
      ,AH,AL:SYS3254,AH,AL:SY
      S3289:IFJ=.THEN260:ELSE
      GOTO190
KK 260 GETA$:A=INSTR(MA$,A$):I
```

```
        FA=.THEN160
BS 270  IFA<5THEN300
JR 280  A=A-4:ONAGOTO350,380,40
        0,420,430,440,450,460,4
        70,480,490,500,520,540,
        550,560,570,580,600,610
        ,630,640,650,660,670,68
        0,690,780
SQ 290  A=A-28:ONAGOTO790,800
DE 300  A=A*2-1:CX=CX+X(A):CY=C
        Y+Y(A):SYS3114,CA/256,C
        AAND255,141
PG 310  IF(CX<.)OR(CX>63)THENCX
        =CX-X(A)
QB 320  IF(CY<.)OR(CY>3)THENCY=
        CY-Y(A)
JM 330  CA=CY*80+CX+4270:SYS312
        5,(CA-4096)/256,(CA-409
        6)AND255:RREG,,C:AD=122
        88+C*16:AL=ADAND255:AH=
        AD/256
AQ 340  SYS3254,AH,AL:SYS3289:S
        YS3114,CA/256,CAAND255,
        181:GOTO160
RJ 350  POKE2606,8:POKE2607,24:
        PRINT"{WHT}{2 HOME}
        {CLR}":FORI=8TO.STEP-1:
        SYS3072,23,I:FORD=.TO99
        :NEXT:NEXT:SYS3072,12,8
        :SYS3072,13,0:SYS3072,2
        0,24:SYS3072,23,8:DIREC
        TORY
PD 360  PRINT" {RVS}PRESS ANY K
        EY TO CONTINUE":GETKEYA
        $:FORI=8TO.STEP-1:SYS30
        72,23,I:FORD=.TO99:NEXT
        :NEXT:SYS3072,34,96:FOR
        D=.TO99:NEXT
JP 370  SYS3072,12,0:SYS3072,13
        ,0:SYS3072,20,16:POKE26
        06,0:POKE2607,16:SYS307
        2,34,.:FORI=.TO8:FORD=.
        TO99:NEXT:SYS3072,23,I:
        NEXT:GOTO160
KS 380  SYS3744:WINDOW14,20,77,
        23,1:INPUT"{WHT}SAVE FI
        LENAME";F$:IFF$=""THEN1
        50
SQ 390  BSAVE(F$),P8192TOP12288
        :GOTO150
PG 400  WINDOW14,20,77,23,1:INP
        UT"{WHT}LOAD FILENAME";
        F$:IFF$=""THEN150
JJ 410  BLOAD(F$),P8192:SYS3784
        :SYS3254,AH,AL:SYS3289:
        GOTO150
BE 420  SYS3568,W,X:GOTO140
SJ 430  SYS3443,W,Y:GOTO140
PP 440  SYS3419,W,Y:GOTO140
XM 450  SYS3590,W,X:GOTO140
RR 460  SYS3670,W,R:GOTO140
MJ 470  SYS3612,W:GOTO140
KS 480  SYS3641,W:GOTO140
RR 490  SYS3711,W,R:GOTO140
CB 500  W=XOR(W,1):WINDOW1,20,1
        0,23:IFW=1THENW$="{6} O
        N":ELSEW$="{6}OFF"
PP 510  CHAR1,6,.,W$:GOTO160
PB 520  P=XOR(P,1):WINDOW1,20,1
        0,23:IFP=1THENP$="{6}PA
        RT ":ELSEP$="{6}WHOLE"
HX 530  CHAR1,3,1,P$:GOTO160
DG 540  SYS3486:GOTO140
PB 550  SYS3527:GOTO140
QP 560  GOSUB590:SYS3406,T:GOTO
        140
GQ 570  GOSUB590:SYS3196:SYS338
        9,T:GOTO140
DJ 580  GOSUB590:SYS3196:SYS346
        7,T:GOTO140
QB 590  IFP=1THENT=Y:RETURN:ELS
        ET=R:RETURN
DB 600  SYS3136:GOTO140
SQ 610  WINDOW14,20,77,23,1:PRI
        NT"ARE YOU SURE?":GETKE
        YA$:IFA$="N"ORA$<>"Y"TH
        EN150
AC 620  BANK14:SYS3890,208+CC*8
        :BANK15:SYS3784:SYS3254
        ,AH,AL:GOTO140
RX 630  GOSUB590:SYS3196:SYS382
        0,T:SYS3208:GOTO140
ER 640  SYS3949:GOTO160
JJ 650  SYS3961:GOTO140
BP 660  RA=(208+CC*8)*256+(C*8)
        :BANK14:FORI=.TO7:POKE2
        816+I,PEEK(RA+I):NEXT:F
        ORI=8TO15:POKE2816+I,.:
        NEXT:BANK15:GOTO140
EG 670  SYS3114,PA/256,PAAND255
        ,15:X=.:Y=.:PA=4259:SYS
        3114,PA/256,PAAND255,59
        :GOTO160
SQ 680  WINDOW14,20,77,23,1:PRI
        NT"{WHT}QUIT CHARACTER
        {SPACE}SET":PRINT"ARE Y
        OU SURE?":GETKEYA$:IFA$
        ="N"ORA$<>"Y"THEN150:EL
        SEGOTO60
GA 690  IFR=7ORR=15THENV=R:GOTO
        710
AF 700  WINDOW14,20,77,23,1:INP
        UT"{WHT}# CHARACTER ROW
        S USED FOR ACTUAL DISPL
        AY(8/16)";V:V=V-1:IFV<>
        7ANDV<>15THEN700
QS 710  FORI=8TO.STEP-1:SYS3072
        ,23,I:FORD=.TO99:NEXT:N
        EXT:SYS3072,34,96
EP 720  IFV=15THENSYS3072,4,15:
        SYS3072,5,6:SYS3072,6,1
        2:SYS3072,7,15:SYS3072,
        9,15:WINDOW0,0,79,11:SY
        S3072,11,15:ELSEPRINT"
        {2 HOME}"
AQ 730  POKE2606,8:POKE2607,24:
        PRINTCHR$(11)"{WHT}
        {CLR}";:SYS3072,12,8:SY
        S3072,13,0:SYS3072,20,2
        4
AC 740  PRINTCHR$(142)TAB(34)"S
        AMPLE FONT":PRINTTAB(18
        )"{DOWN}{CYN}PRESS ALT
        {SPACE}TO RETURN TO MAI
        N SCREEN{WHT}"CHR$(14)
AF 750  SYS3072,34,.:FORI=.TOV:
        FORD=.TO99:NEXT:SYS3072
        ,23,I:NEXT:SYS3973:FORI
        =120TO113STEP-1:SYS3072
        ,22,I:FORD=.TO99:NEXT:N
        EXT:FORD=.TO99:NEXT
MH 760  IFV=15THENSYS3072,4,32:
        SYS3072,5,224:SYS3072,6
        ,25:SYS3072,7,29:SYS307
        2,9,231:SYS3072,23,232:
        SYS3072,11,7
PR 770  SYS3072,12,0:SYS3072,13
        ,0:SYS3072,20,16:POKE26
        06,0:POKE2607,16:PRINTC
        HR$(142):WINDOW14,20,77
        ,23,1:FORI=113TO120:FOR
        D=.TO99:NEXT:SYS3072,22
        ,I:NEXT:GOTO160
KM 780  SYS3997:GOTO140
GD 790  SYS4019:GOTO140
XE 800  WINDOW14,8,77,17,1:H=H+
        1:IFH=4THENH=1
CQ 810  ONHGOTO820,910,970
PF 820  PRINT"{WHT}{B}CHARACTER
        EDIT FEATURES"SPC(11)"
        {B}MISC. FEATURES"
CQ 830  PRINT"{3 SPACES}R
        {3 SPACES}- ROTATE CLOC
        KWISE"SPC(12)"T
        {3 SPACES}- TYPE/TRY FO
        NT"
MK 840  PRINT"SHFT-R - ROTATE C
        OUNTERCLOCKWISE
        {2 SPACES}CMMD-9 - REV
        {SPACE}1ST TO 2ND HALF"
XG 850  PRINT"CTRL-R - REVERSE"
        SPC(21)"O{3 SPACES}- RE
        STORE CHAR"
SJ 860  PRINT"{3 SPACES}F
        {3 SPACES}- FLIP"SPC(21
        )"SHFT-O - STASH CHAR"
QA 870  PRINT"{3 SPACES}M
        {3 SPACES}- MIRROR"SPC(
        19)"SHFT-N - RESTORE RO
        M CHAR SET"
XE 880  PRINT"{3 SPACES}E
        {3 SPACES}- EXPAND CHAR
        "SPC(17)"Q{3 SPACES}- Q
        UIT CHAR SET"
DS 890  PRINT"{3 SPACES}C
        {3 SPACES}- COMPACT CHA
        R":PRINT"SH-CLR - CLEAR
         CHARACTER"
XG 900  PRINT"{3 SPACES}N
        {3 SPACES}- RESTORE ROM
         CHAR";:GOTO160
FS 910  PRINTSPC(23)"{WHT}{B}SC
        ROLLING FEATURES"
FP 920  PRINTSPC(7)"SCRL UP"SPC
        (32)"SCRL COL UP"
BS 930  PRINTSPC(10)"{6}8"SPC(4
        0)"Y":PRINT"{DOWN}
        {WHT}SCRL"SPC(11)"SCRL"
        SPC(22)"SCRL"SPC(11)"SC
        RL"
RA 940  PRINT" LEFT {6}4"SPC(7)
        "6 {WHT}RIGHT"SPC(21)"R
        OW{2 SPACES}{6}G"SPC(7)
        "H {WHT}ROW"
CM 950  PRINTSPC(42)"LEFT"SPC(1
        1)"RIGHT":PRINTSPC(10)"
        {6}{DOWN}2"SPC(40)"B"
XC 960  PRINTSPC(6)"{WHT}SCRL D
        OWN"SPC(30)"SCRL COL DO
        WN";:GOTO160
QF 970  PRINT"{WHT}{B}DISK COMM
        ANDS"SPC(21)"{B}TOGGLES
        "
EK 980  PRINT"{3 SPACES}D
        {3 SPACES}- DIRECTORY"S
        PC(16)"W{3 SPACES}- WRA
        P ON/OFF"
HA 990  PRINT"{3 SPACES}S
        {3 SPACES}- SAVE CHAR S
        ET"SPC(12)"P{3 SPACES}-
         PART/WHOLE CHAR EDIT"
CH 1000 PRINT"{3 SPACES}L
        {3 SPACES}- LOAD CHAR
        {SPACE}SET":PRINT"
        {3 SPACES}@{3 SPACES}-
         DOS COMMAND":PRINT"
        {B}{DOWN}CURSOR FEATUR
        ES"
RA 1010 PRINT" HOME{2 SPACES}-
         HOME CHAR EDIT CURSOR
        ":PRINT"CURSOR":PRINT"
         KEYS{2 SPACES}- MOVE
        {SPACE}CHAR SELECT CUR
        SOR";:GOTO160
RJ 1020 IFA$="{STOP}"THENSTOP
XG 1030 IFDS<>.THENPRINTDS$:RE
        SUME160
XH 1040 DATA.,-1,1,-1,1,.,1,1,
        .,1,-1,1,-1,.,-1,-1
```

Program 3: EXCEL.OBJ.

```
0C00:8D 00 D6 2C 00 D6 10 FB F3
0C08:8E 01 D6 60 8D 00 D6 2C CE
0C10:00 D6 10 FB AE 01 D6 60 27
0C18:8E 30 0B AA A9 12 20 00 65
```

```
0C20:0C A9 13 AE 30 0B 20 00 E3
0C28:0C 60 20 18 0C 98 AA A9 A5
0C30:1F 20 00 0C 60 20 18 0C 60
0C38:A9 1F 20 0C 0C 8A A8 60 ED
0C40:A2 0F A9 00 9D 00 0B CA 70
0C48:10 FA 60 A2 0F A9 00 9D 1A
0C50:10 0B CA 10 FA 60 20 18 3F
0C58:0C A0 00 A9 1F BE 00 0B 38
0C60:20 00 0C C8 C0 10 D0 F5 74
0C68:60 20 18 0C A0 00 A9 1F F3
0C70:BE 10 0B 20 00 0C C8 C0 D1
0C78:10 D0 F5 60 A2 0F BD 00 5E
0C80:0B 9D 10 0B CA 10 F7 60 1F
0C88:A2 0F BD 10 0B 9D 00 0B 48
0C90:CA 10 F7 60 8E 31 0B AA 11
0C98:38 A9 00 2A CA D0 FC AE 1C
0CA0:31 0B C0 00 D0 09 49 FF 69
0CA8:3D 00 0B 9D 00 0B 60 1D A4
0CB0:00 0B 9D 00 0B 60 20 18 71
0CB8:0C A9 1F A0 00 20 0C 0C D3
0CC0:8A 99 00 0B A9 1F C8 C0 51
0CC8:10 D0 F2 60 48 8A 48 20 9E
0CD0:40 0C 68 AA 68 20 56 0C 40
0CD8:60 A9 A3 8D 39 0B A9 00 22
0CE0:8D 3A 0B 8D 3B 0B 8D 3D E6
0CE8:0B AC 3B 0B B9 00 0B 8D 3B
0CF0:3C 0B 0E 3C 0B 90 05 A0 B4
0CF8:A0 4C FE 0C A0 20 AD 3A 30
0D00:0B AE 39 0B 20 2A 0C AC 91
0D08:3D 0B C0 07 F0 0E EE 3D E6
0D10:0B EE 39 0B D0 03 EE 3A ED
0D18:0B 4C F2 0C 18 AD 39 0B DE
0D20:69 49 8D 39 0B AD 3A 0B 15
0D28:69 00 8D 3A 0B EE 3B 0B E1
0D30:A0 00 8C 3D 0B AC 3B 0B 8C
0D38:C0 10 D0 AD 60 A8 A2 00 96
0D40:B9 00 0B 9D 10 0B E8 88 79
0D48:10 F6 20 88 0C 60 A8 B9 A1
0D50:00 0B 49 FF 99 00 0B 88 C1
0D58:10 F5 60 C9 00 D0 04 5E 4A
0D60:00 0B 60 18 7E 00 0B B0 85
0D68:01 60 A9 80 1D 00 0B 9D F4
0D70:00 0B 60 C9 00 D0 04 1E 5F
0D78:00 0B 60 18 3E 00 0B B0 9B
0D80:01 60 A9 01 1D 00 0B 9D 15
0D88:00 0B 60 AA A0 08 7E 00 3E
0D90:0B 3E 10 0B 88 D0 F7 CA B4
0D98:10 F2 20 88 0C 60 20 4B 71
0DA0:0C A9 01 8D 38 0B A2 00 57
0DA8:A0 07 AD 38 0B 5E 00 0B EA
0DB0:90 06 19 10 0B 99 10 0B A2
0DB8:88 10 EF 0E 38 0B E8 E0 9A
0DC0:08 D0 E5 20 88 0C 60 20 27
0DC8:4B 0C A9 80 8D 38 0B A2 CE
0DD0:00 A0 07 AD 38 0B 1E 00 F8
0DD8:0B 90 06 19 10 0B 99 10 DE
0DE0:0B 88 10 EF 4E 38 0B E8 F5
0DE8:E0 10 D0 E5 20 88 0C 60 8B
0DF0:8D 30 0B 8E 31 0B 20 9E BC
0DF8:0D AD 30 0B AE 31 0B 20 2C
0E00:5B 0D 20 C7 0D 60 8D 30 C2
0E08:0B 8E 31 0B 20 9E 0D AD 67
0E10:30 0B AE 31 0B 20 73 0D BC
0E18:20 C7 0D 60 A8 A2 0F 1E E9
0E20:00 0B 08 C0 00 F0 0D 28 12
0E28:90 0B BD 00 0B 09 01 9D 23
0E30:00 0B D0 01 28 CA 10 E7 AD
0E38:60 A8 A2 0F 5E 00 0B 08 05
0E40:C0 00 F0 0D 28 90 0B BD 03
0E48:00 0B 09 80 9D 00 0B D0 24
0E50:01 28 CA 10 E7 60 A8 AD 11
0E58:00 0B 8D 3C 0B E8 8E 31 F6
0E60:0B A2 01 BD 00 0B 9D FF 0E
0E68:0A E8 EC 31 0B D0 F4 C0 BA
0E70:00 F0 07 AD 3C 0B 9D FF CD
0E78:0A 60 A9 00 4C 76 0E A8 E7
0E80:BD 00 0B 8D 3C 0B CA BD 17
0E88:00 0B 9D 01 0B CA 10 F7 C6
0E90:C0 00 F0 07 AD 3C 0B 8D 9D
0E98:00 0B 60 A9 00 4C 97 0E 8C
0EA0:A9 10 8D 39 0B A9 20 85 9F
0EA8:FB A9 00 AA 85 FA A9 30 73
0EB0:20 18 0C A0 00 A9 1F 20 73
0EB8:0C 0C 8A 91 FA C8 D0 F5 DA
0EC0:E6 FB CE 39 0B D0 EE 60 96
0EC8:A9 20 85 FB A9 00 AA 85 5A
0ED0:FA A9 30 20 18 0C A0 00 0F
0ED8:B1 FA AA A9 1F 20 00 0C 02
0EE0:C8 D0 F5 E6 FB A5 FB C9 FA
0EE8:30 D0 ED 60 8D 36 0B A9 1A
0EF0:30 8D 3A 0B A9 38 8D 3B 05
0EF8:0B A9 00 8D 39 0B AD 3A 69
0F00:0B AE 39 0B 20 B6 0C AD C8
0F08:36 0B 20 4E 0D AD 3B 0B 8D
0F10:AE 39 0B 20 56 0C 18 AD F7
0F18:39 0B 69 10 8D 39 0B 90 BB
0F20:0E EE 3B 0B EE 3A 0B AD 3D
0F28:3B 0B C9 40 D0 01 60 4C 7B
0F30:FE 0E 85 FB A9 20 85 FD 98
0F38:A9 00 85 FA 85 FC A0 00 EC
0F40:B1 FA 91 FC C8 C0 08 D0 22
0F48:F7 18 98 65 FA 85 FA 90 46
0F50:02 E6 FB A9 00 91 FC C8 4C
0F58:C0 10 D0 F9 18 98 65 FC 7F
0F60:85 FC 90 02 E6 FD A5 FD 2B
0F68:C9 30 D0 D2 60 A2 0F BD 28
0F70:00 0B 9D 20 0B CA 10 F7 A2
0F78:60 A2 0F BD 20 0B 9D 00 95
0F80:0B CA 10 F7 60 20 6F CD 88
0F88:20 E4 FF D0 0A A5 D3 29 B4
0F90:08 F0 F5 20 9F CD 60 20 C4
0F98:D2 FF 4C 85 0F A2 07 A0 B3
0FA0:0F BD 00 0B 99 10 0B 88 12
0FA8:99 10 0B 88 CA 10 F2 20 1E
0FB0:88 0C 60 20 4B 0C A2 07 FA
0FB8:A0 0E B9 00 0B 9D 10 0B DB
0FC0:88 88 CA 10 F5 20 88 0C EC
0FC8:60 00 00 00 00 00 00 00 17
```

Program 4: EXCEL.OBJ1.

```
1300:A9 00 8D 36 0B 8D 38 0B 1A
1308:8D 3C 0B AE 36 0B BD 54 FD
1310:13 8D 39 0B BD 58 13 8D FD
1318:3A 0B A2 3F 8E 38 0B AD 7F
1320:3A 0B AE 39 0B AC 3C 0B 1E
1328:20 2A 0C 18 AD 3A 0B 69 C1
1330:10 AE 39 0B A0 8D 20 2A 87
1338:0C EE 3C 0B EE 39 0B D0 9B
1340:03 EE 3A 0B CE 38 0B 10 19
1348:D6 EE 36 0B AE 36 0B E0 52
1350:04 90 B8 60 AE FE 4E 9E 66
1358:00 00 01 01 00 00 00 00 AE
```

Program 5: EXCEL.UTL.

```
XC 10 GRAPHIC5,1:COLOR6,1:PRIN
      TCHR$(142)CHR$(5);:IFT=.
      THENT=1:BLOAD"EXCEL.OBJ2
      "
HA 20 PRINTSPC(32)"{B}EXCELFON
      T UTILITY":PRINTSPC(27)"
      {DOWN}{YEL}1) COMBINE CH
      ARACTER SETS":PRINTSPC(2
      7)"2) DIRECTORY"
CG 30 GETA$:A=VAL(A$):IFA<>1AN
      DA<>2THEN30
FS 40 ONAGOTO50,70
QE 50 INPUT"{DOWN}{PUR}EXCELFO
      NT CHARACTER SET {WHT}1
      {PUR} FILENAME";F1$:INPU
      T"{PUR}EXCELFONT CHARACT
      ER SET {WHT}2{PUR} FILEN
      AME";F2$:INPUT"{DOWN}{6}
      MERGED CHARACTER SET FIL
      ENAME";F3$
XD 60 BLOAD(F1$),P8192:BLOAD(F
      2$),P12288:BSAVE(F3$),P8
      192TOP16383:GOTO10
SC 70 DIRECTORY:PRINT"{DOWN}
      {RVS}{WHT}PRESS ANY KEY
      {SPACE}TO CONTINUE":GETK
      EYA$:GOTO10
```

Program 6: EXCEL.OBJ2.

```
0C00:A0 00 8D 00 FF A2 12 A9 72
0C08:20 85 FB 20 CC CD E8 A9 2C
0C10:00 85 FA 20 CC CD A0 00 C9
0C18:B1 FA 20 CA CD C8 D0 F8 A4
0C20:E6 FB A5 FB C9 40 D0 F0 01
0C28:60 00 00 00 00 00 00 00 70
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How to Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

Pointer

See instructions in article on page 52 before typing in.

Program 1: Pointer

```
CF00:78 A9 40 8D 14 03 A9 CF F6
CF08:8D 15 03 58 A2 3F BD B2 D9
CF10:CF 9D C0 02 CA 10 F7 A9 67
CF18:64 8D 0E D0 8D 0F D0 A9 10
CF20:01 8D 2E D0 A9 80 8D 15 F5
CF28:D0 AD 18 D0 29 F0 4A 4A 97
CF30:18 69 03 85 FC A9 FF 85 03
CF38:FB A0 00 A9 0B 91 FB 60 8F
CF40:AD 00 DC A0 00 A2 00 4A 31
CF48:B0 03 CE 0F D0 4A B0 03 DF
CF50:EE 0F D0 4A B0 03 CE 0E 27
CF58:D0 4A B0 03 EE 0E D0 AD 38
CF60:0F D0 C9 31 D0 03 EE 0F 87
CF68:D0 AD 0F D0 C9 F7 D0 03 9D
CF70:CE 0F D0 AD 10 D0 29 80 C6
CF78:D0 1C AD 0E D0 C9 17 D0 CA
CF80:03 EE 0E D0 AD 0E D0 C9 3D
CF88:00 D0 24 AD 10 D0 09 80 12
CF90:8D 10 D0 4C AF CF AD 0E FF
CF98:D0 C9 54 D0 03 CE 0E D0 EA
CFA0:AD 0E D0 C9 FF D0 08 AD 52
CFA8:10 D0 29 7F 8D 10 D0 4C 3C
CFB0:31 EA F0 00 00 E0 00 00 45
CFB8:90 00 00 08 00 00 00 00 21
CFC0:00 00 00 00 00 00 00 00 60
CFC8:00 00 00 00 00 00 00 00 68
CFD0:00 00 00 00 00 00 00 00 70
CFD8:00 00 00 00 00 00 00 00 78
CFE0:00 00 00 00 00 00 00 00 80
CFE8:00 00 00 00 00 00 00 00 88
CFF0:00 00 00 00 00 00 00 00 90
```

Program 2: Finder

```
GF 10 REM COPYRIGHT 1988 COMPU
      TE! PUBLICATIONS, INC. -
       ALL RIGHTS RESERVED.
HR 20 IFA<>1THENA=1:LOAD"POINT
      ER",8,1
PA 30 SYS52992
GA 40 DIMC(39)
PD 50 PRINT"{CLR}";:GOSUB160
QR 60 FORI=0TO39:C(I)=PEEK(102
      4+I):NEXT
HS 70 WAIT56320,16,16
JM 80 X%=((PEEK(53262)-255*(PE
      EK(53264)=128))-24)/8
CR 90 Y%=(PEEK(53263)-49)/8:SL
      =40*Y%+X%
FA 100 PRINT"{HOME}{RVS}X=";X%
      ;"Y=";Y%;"SL=";SL
MP 110 GETA$:IFA$=""THEN110
XK 120 IFA$="Q"THENPRINT"{CLR}
      ":END
DE 130 IFA$<>" "THEN110
KX 140 FORI=0TO39:POKE1024+I,C
      (I):NEXT
MX 150 GOTO70
HH 160 PRINT"{CLR}{9 DOWN}"TAB
      (13)"COPYRIGHT 1988"
BB 170 PRINTTAB(7)"{DOWN}COMPU
      TE! PUBLICATIONS, INC."
```

```
RH 180 PRINTTAB(10)"{DOWN}ALL
       {SPACE}RIGHTS RESERVED.
       "
FC 190 RETURN
```

Big Screen Converter

See instructions in article on page 45 before typing in.

```
0801:0B 08 FF FF 9E 32 30 39 EF
0809:39 00 31 08 FF FF 8F 14 8F
0811:14 14 14 14 14 14 14 14 21
0819:31 39 38 38 20 43 4F 4D 94
0821:50 55 54 45 21 20 50 55 0D
0829:42 2E 2C 20 49 4E 43 00 77
0831:00 00 A9 00 85 C6 8D F5 CE
0839:08 8D F6 08 20 3E 0A 20 3E
0841:5C 0A 20 F4 0A A2 17 A0 FE
0849:00 18 20 F0 FF A9 00 AA C3
0851:A8 BD C6 0A F0 09 20 D2 5D
0859:FF E8 4C 52 08 A0 00 20 35
0861:CF FF 99 9E 07 C8 C9 0D 72
0869:D0 F5 C0 02 D0 01 60 A9 8C
0871:14 20 D2 FF 88 98 A2 9E 78
0879:A0 07 20 BD FF A9 08 A2 D4
0881:08 A0 00 20 BA FF 20 C0 96
0889:FF A2 A0 A0 00 86 FC 84 F8
0891:FB A2 08 20 C6 FF 20 DB 9D
0899:08 20 A9 0A 20 80 0A 20 C2
08A1:CF FF 20 F7 08 EE 6E 0B 01
08A9:D0 03 EE 6F 0B AD 6F 0B B0
08B1:C9 1F 90 EB AD 6E 0B C9 46
08B9:40 B0 12 20 B7 FF 29 40 AA
08C1:F0 DD A9 08 20 C3 FF 20 A7
08C9:CC FF 4C 5C 0A 20 CF FF FF
08D1:20 B7 FF 29 40 F0 F6 4C 72
08D9:C3 08 20 CF FF EE F5 08 7E
08E1:D0 03 EE F6 08 AD F6 08 55
08E9:C9 04 90 EE AD F5 08 C9 FF
08F1:02 90 E7 60 00 00 A2 00 6F
08F9:A0 00 8C D7 0A 8C D8 0A A7
0901:8D CE 0A AD CE 0A 3D CF 92
0909:0A F0 09 BD D9 0A 0D D7 42
0911:0A 8D D7 0A E8 E0 04 90 8A
0919:EA AD CE 0A 3D CF 0A F0 B4
0921:09 BD D9 0A 0D D8 0A 8D 70
0929:D8 0A E8 E0 08 90 EA A2 50
0931:00 A0 00 AD D7 0A 91 19 69
0939:20 E1 0A 91 19 AD D8 0A 69
0941:91 1B 20 E8 0A 91 1B 20 62
0949:E1 0A 20 E8 0A EE EF 0A 57
0951:AD EF 0A C9 04 B0 01 60 59
0959:A9 00 8D EF 0A EE F0 0A E8
0961:AD F0 0A 8D 20 D0 C9 02 7A
0969:F0 25 AD F2 0A C9 0C D0 82
0971:03 4C 24 0B A5 19 18 69 78
0979:38 85 19 90 02 E6 1A E6 FB
0981:1A A5 1B 18 69 38 85 1B 41
0989:90 02 E6 1C E6 1C 60 A9 15
0991:00 8D F0 0A AD F2 0A C9 DC
0999:0C D0 06 20 49 0B 4C BC 74
09A1:09 A5 19 38 E9 38 85 19 9C
09A9:B0 02 C6 1A C6 1A A5 1B 14
09B1:38 E9 38 85 1B B0 02 C6 20
09B9:1C C6 1C EE F1 0A AD F1 03
09C1:0A C9 14 B0 01 60 A9 00 B5
09C9:8D F1 0A EE F3 0A AD F3 66
09D1:0A C9 02 F0 25 A5 19 18 B4
09D9:69 C0 85 19 90 02 E6 1A 87
09E1:A5 1A 18 69 1E 85 1A A5 C7
09E9:1B 18 69 C0 85 1B 90 02 84
09F1:E6 1C A5 1C 18 69 1E 85 1D
09F9:1C 60 A9 00 8D F3 0A A5 5D
0A01:19 38 E9 C0 85 19 B0 02 EC
0A09:C6 1A 38 A5 1A E9 1E 85 A2
0A11:1A A5 1B 38 E9 C0 85 1B FA
0A19:B0 02 C6 1C A5 1C 38 E9 98
0A21:1E 85 1C EE F2 0A AD F2 26
0A29:0A C9 0D F0 01 60 A9 61 A3
0A31:85 1A 85 1C A9 40 85 19 73
0A39:A9 48 85 1B 60 A9 20 85 06
0A41:1C 85 1A A9 00 85 19 8D 78
0A49:EF 0A 8D F0 0A 8D F1 0A 0D
0A51:8D F3 0A 8D F2 0A A9 08 5E
0A59:85 1B 60 AD 02 DD 09 03 7A
0A61:8D 02 DD AD 00 DD 29 FC 1A
0A69:09 03 8D 00 DD A9 15 8D C1
0A71:18 D0 A9 1B 8D 11 D0 A9 A8
0A79:00 85 C6 8D 15 D0 60 A5 F2
0A81:01 29 FE 85 01 AD 02 DD 39
0A89:09 03 8D 02 DD AD 00 DD 38
0A91:29 FC 09 03 8D 00 DD AD A0
0A99:18 D0 09 08 8D 18 D0 AD AB
0AA1:11 D0 09 20 8D 11 D0 60 48
0AA9:A9 04 85 FC A9 00 85 FB 68
0AB1:A2 00 A9 01 A0 00 91 FB 80
0AB9:C8 C0 00 D0 F9 E6 FC E8 BD
0AC1:E0 04 D0 F2 60 90 46 49 AB
0AC9:4C 45 3A 20 00 00 80 40 DF
0AD1:20 10 08 04 02 01 00 00 4F
0AD9:C0 30 0C 03 C0 30 0C 03 ED
0AE1:E6 19 D0 02 E6 1A 60 E6 31
0AE9:1B D0 02 E6 1C 60 00 00 D0
0AF1:00 00 00 A9 20 85 FC A9 5B
0AF9:00 85 FB A8 91 FB C8 D0 58
0B01:FB E6 FC A5 FC C9 A0 B0 C9
0B09:04 A9 00 F0 EF 60 C6 19 42
0B11:A5 19 C9 FF D0 02 C6 1A AF
0B19:C6 1B A5 1B C9 FF D0 02 B1
0B21:C6 1C 60 A5 19 18 69 F8 FC
0B29:85 19 90 02 E6 1A A5 1A 7F
0B31:18 69 21 85 1A A5 1B 18 DF
0B39:69 F8 85 1B 90 02 E6 1C 1B
0B41:A5 1C 18 69 21 85 1C 60 82
0B49:A5 19 38 E9 F8 85 19 B0 DE
0B51:02 C6 1A A5 1A 38 E9 21 5E
0B59:85 1A A5 1B 38 E9 F8 85 FF
0B61:1B B0 02 C6 1C A5 1C 38 C5
0B69:E9 21 85 1C 60 00 00 00 32
```

Arcade Volleyball

See instructions in article on page 32 before typing in.

```
0801:0C 08 0A 00 9E 20 32 30 64
0809:36 32 00 00 00 4C 92 08 1F
0811:00 A9 7F 8D 0D DC A9 FF 83
0819:8D 00 DC AD 11 D0 29 80 05
0821:D0 F9 AD 12 D0 D0 FB A9 5A
0829:81 8D 0D DC 60 98 AA 0A 91
0831:A8 AD 8F 0A 99 7D 0A BD 28
0839:99 0A 2D 8C 0A 8D 8C 0A B0
0841:AD 8E 0A F0 09 BD 91 0A 88
0849:0D 8C 0A 8D 8C 0A AD 8D 92
0851:0A 99 7C 0A 60 AD 79 0A B3
0859:18 69 32 8D 8F 0A A9 00 E6
0861:8D 8E 0A AD 7B 0A 8D 8D A4
0869:0A AD 7A 0A 0A 2E 8D 0A 08
0871:2E 8E 0A AD 8D 0A 18 69 86
0879:18 8D 8D 0A AD 8E 0A 69 70
0881:00 8D 8E 0A 60 A0 10 B9 C6
0889:7C 0A 99 00 D0 88 10 F7 4E
0891:60 A9 FF 8D 15 D0 A9 E1 36
0899:8D F8 07 A9 E2 8D F9 07 72
08A1:A9 E3 8D FA 07 A9 E4 8D 17
08A9:FB 07 A9 E7 8D FC 07 A9 45
08B1:00 8D 78 0A 8D 79 0A 8D C8
08B9:7A 0A 8D 7B 0A 8D 8D 0A 9E
08C1:8D 8E 0A 8D 8F 0A 8D 90 A6
08C9:0A A0 11 99 B0 0E 88 10 A1
08D1:FA 8D 6B 0F 8D 6C 0F 8D EA
08D9:6D 0F 8D 6E 0F 8D 6F 0F 99
08E1:8D 70 0F 8D 71 0F 8D 72 E4
08E9:0F 8D A3 15 8D A4 15 8D 61
08F1:D7 15 8D 5E 16 8D 5F 16 86
08F9:A9 01 8D 37 15 8D A2 15 7D
0901:8D D8 15 A9 00 8D B5 0F FD
0909:8D B6 0F 8D B7 0F 8D B9 19
0911:0F 8D BA 0F 8D BB 0F A9 79
0919:8C 8D B8 0F A9 7D 8D BC F7
0921:0F A9 00 8D 66 16 A2 3F 0E
0929:BD A1 0B 9D 40 38 BD E1 FD
0931:0B 9D 80 38 BD 21 0C 9D EB
0939:40 39 BD 61 0C 9D C0 38 18
0941:BD A1 0C 9D 00 39 BD E1 38
0949:0C 9D 80 39 BD A1 0A 9D 92
0951:C0 39 BD E1 0A 9D 00 3A E8
0959:BD 21 0B 9D 40 3A BD 61 95
0961:0B 9D 80 3A CA 10 C1 A9 D7
0969:32 8D 7A 0A 8D 78 0A 8D D7
0971:7B 0A 8D 79 0A A0 00 20 FF
0979:56 08 20 2E 08 A9 78 8D 05
0981:79 0A A9 1E 8D 7B 0A A0 F8
0989:02 20 56 08 20 2E 08 A9 63
0991:78 8D 79 0A A9 6E 8D 7B B0
0999:0A A0 01 20 56 08 20 2E 3C
09A1:08 A9 78 8D 79 0A A9 28 79
09A9:8D 7B 0A A0 04 20 56 08 02
09B1:20 2E 08 A9 78 8D 79 0A F1
09B9:A9 64 8D 7B 0A A0 03 20 1C
09C1:56 08 20 2E 08 20 86 08 BD
09C9:A9 01 8D 2B D0 A9 04 8D 18
09D1:27 D0 A9 02 8D 28 D0 A9 59
09D9:07 8D 29 D0 A9 05 8D 2A AB
09E1:D0 A9 00 8D 21 D0 8D 20 27
09E9:D0 A9 93 20 D2 FF A9 8E BB
09F1:20 D2 FF A9 08 20 D2 FF C9
09F9:A9 56 8D F3 05 8D 1B 06 02
0A01:8D 43 06 8D 6B 06 8D 93 68
0A09:06 A9 A0 8D BB 06 8D E3 6C
0A11:06 8D 0B 07 8D 33 07 8D 32
0A19:5B 07 A9 64 8D 5A 07 8D 89
0A21:5C 07 A9 79 8D CB 05 20 B7
0A29:D6 10 20 FA 15 A9 0C A0 68
0A31:FA 88 99 00 D8 99 FA D8 14
0A39:99 F4 D9 99 EE DA D0 F1 A2
0A41:A9 1F 20 D2 FF A9 01 8D 59
0A49:F3 D9 8D 1B DA 8D 43 DA 9F
0A51:8D 6B DA 8D 93 DA AD 7C 1B
0A59:16 C9 41 D0 F9 A2 00 A0 1B
0A61:0B 18 20 F0 FF A2 00 BD 5C
0A69:67 16 F0 07 20 D2 FF E8 7A
0A71:4C 68 0A EA 4C 84 0D 00 44
0A79:00 00 00 00 00 00 00 00 8D
0A81:00 00 00 00 00 00 00 00 95
0A89:00 00 00 00 00 00 00 00 9D
0A91:01 02 04 08 10 20 40 80 A9
0A99:FE FD FB F7 EF DF BF 7F A9
0AA1:00 00 00 00 00 00 00 B7 6D
0AA9:00 03 D7 C0 0D E7 70 1C 8A
0AB1:EF 78 1B 6E E8 37 9E CC 54
0AB9:2E 7D D0 1D BD DC 3B DD E5
0AC1:DC 35 E3 8C 16 7C 54 17 39
0AC9:9F D8 0B E3 90 02 7C 60 69
0AD1:00 BB 80 00 00 00 00 00 E4
0AD9:00 00 00 00 00 00 00 00 ED
0AE1:00 00 00 00 00 00 00 BB B1
0AE9:80 02 7C 60 0B E3 90 17 74
0AF1:9F D8 16 7C 54 35 E3 8C 62
0AF9:3B DD DC 1D BD DC 2E 7D CB
0B01:D0 37 9E CC 1B 6E E8 1C 6E
0B09:EF 78 0D E7 70 03 D7 C0 55
0B11:00 B7 00 00 00 00 00 00 15
0B19:00 00 00 00 00 00 00 00 2F
0B21:00 00 00 00 00 00 00 ED 25
0B29:00 03 EB C0 0E E7 B0 1E 19
0B31:F7 38 17 76 D8 33 79 EC 0F
0B39:0B BE 74 3B BD B8 3B BB C9
0B41:DC 31 C7 AC 2A 3E 68 1B 0C
0B49:F9 E8 09 C7 D0 06 3E 40 8F
0B51:01 DD 00 00 00 00 00 00 5F
0B59:00 00 00 00 00 00 00 00 6F
0B61:00 00 00 00 00 00 01 DD 57
0B69:00 06 3E 40 09 C7 D0 1B F0
0B71:F9 E8 2A 3E 68 31 C7 AC 2C
0B79:3B BB DC 3B BD B8 0B BE 11
0B81:74 33 79 EC 17 76 D8 1E FE
0B89:F7 38 0E E7 B0 03 EB C0 14
0B91:00 ED 00 00 00 00 00 00 23
0B99:00 00 00 00 00 00 00 00 AF
0BA1:00 00 00 00 00 00 00 7F 37
0BA9:E0 01 FF F8 07 E1 F8 0F C0
0BB1:FE FC 0E 0F FC 0E 8F 8C 05
0BB9:1E CF F4 3F FF F4 3F C7 7F
0BC1:8C 0C 1F FC 07 FF F8 03 02
0BC9:FF F0 01 FF E0 00 FF 80 C3
0BD1:00 1E 00 00 1C 00 00 0E 5E
0BD9:00 00 0E 00 00 FF 00 8C 3E
```

```
0BE1:00 00 00 00 00 00 00 7F 77
0BE9:E0 01 FF F8 07 E1 F8 0F 01
0BF1:FE FC 0E 0F FC 0E 8F 8C 45
0BF9:1E CF F4 3F FF F4 3F C7 BF
0C01:8C 0C 1F FC 07 FF F8 03 43
0C09:FF F0 01 FF E0 00 FF 80 05
0C11:00 3F 00 00 73 00 00 63 F7
0C19:80 00 61 C0 01 E7 00 8C DD
0C21:00 7F E0 01 FF F8 07 E1 19
0C29:F8 0F FE FC 0E 0F FC 0E E5
0C31:8F 8C 1E CF F4 3F FF F4 8E
0C39:3F C7 8C 0C 1F FC 07 FF 30
0C41:F8 03 FF F0 01 FF E0 00 6F
0C49:FF 80 00 1E 00 00 1C 00 9B
0C51:00 0E 00 00 0E 00 00 1F 7C
0C59:00 00 30 00 00 C0 00 00 7A
0C61:00 00 00 00 00 00 07 FE 86
0C69:00 1F FF 80 1F 87 E0 3F 69
0C71:7F F0 3F F0 70 31 F1 70 19
0C79:2F F3 78 2F FF FC 31 E3 62
0C81:FC 3F F8 30 1F FF E0 0F D3
0C89:FF C0 07 FF 80 01 FF 00 BA
0C91:00 78 00 00 38 00 00 70 F9
0C99:00 00 70 00 00 FF 00 8C 4C
0CA1:00 00 00 00 00 00 07 FE C6
0CA9:00 1F FF 80 1F 87 E0 3F A9
0CB1:7F F0 3F F0 70 31 F1 70 59
0CB9:2F F3 78 2F FF FC 31 E3 A2
0CC1:FC 3F F8 30 1F FF E0 0F 14
0CC9:FF C0 07 FF 80 01 FF 00 FA
0CD1:00 FC 00 00 CE 00 01 C6 68
0CD9:00 03 86 00 00 E7 80 8C B0
0CE1:07 FE 00 1F FF 80 1F 87 F6
0CE9:E0 3F 7F F0 3F F0 70 31 11
0CF1:F1 70 2F F3 78 2F FF FC C1
0CF9:31 E3 FC 3F F8 30 1F FF FD
0D01:E0 0F FF C0 07 FF 80 01 95
0D09:FF 00 00 78 00 00 38 00 1B
0D11:00 70 00 00 70 00 00 F8 C3
0D19:00 00 0C 00 00 03 00 00 C0
0D21:AD 00 DC 8D B1 0E AD 01 A8
0D29:DC 8D B0 0E A9 00 8D 6E E2
0D31:0F 8D 6D 0F AD B0 0E 29 4A
0D39:10 D0 05 A9 01 8D 6D 0F F2
0D41:AD B1 0E 29 10 D0 05 A9 6A
0D49:01 8D 6E 0F EA AD B1 0E 85
0D51:29 04 D0 10 CE B3 0E A9 27
0D59:01 8D BC 0E A9 00 8D BA F2
0D61:0E 4C C5 0E AD B1 0E 29 A8
0D69:08 D0 10 EE B3 0E A9 01 D6
0D71:8D BC 0E A9 01 8D BA 0E 9F
0D79:4C C5 0E A9 00 8D BC 0E 45
0D81:4C C5 0E 20 12 08 20 21 09
0D89:0D 20 FA 0E 20 F0 12 20 7B
0D91:9C 14 20 83 0F 20 BD 11 C0
0D99:20 4B 12 20 BD 0F 20 23 68
0DA1:10 20 DB 0D 20 86 08 20 63
0DA9:A5 15 AD 66 16 F0 D4 A9 BF
0DB1:00 8D 5E 16 8D 5F 16 A9 1C
0DB9:01 8D D8 15 8D A2 15 A9 EE
0DC1:00 8D AF 0E 20 73 11 CE D5
0DC9:AF 0E AD AF 0E D0 F5 A9 39
0DD1:00 85 C6 A5 C6 F0 FC 4C C0
0DD9:92 08 AD B3 0E 8D 7B 0A D7
0DE1:A9 9B 38 ED 6F 0F 8D 79 E9
0DE9:0A A9 00 8D 7A 0A 8D 78 DB
0DF1:0A A0 00 20 56 08 20 2E 7C
0DF9:08 AD B3 0E 18 69 20 8D 0F
0E01:7B 0A A0 01 20 56 08 20 0C
0E09:2E 08 AD B7 0E 8D 7B 0A 17
0E11:A9 9B 38 ED 70 0F 8D 79 23
0E19:0A A9 00 8D 7A 0A 8D 78 0D
0E21:0A A0 02 20 56 08 20 2E ED
0E29:08 AD B7 0E 18 69 20 8D C0
0E31:7B 0A A0 03 20 56 08 20 5C
0E39:2E 08 AD BA 0E 0A 18 69 02
0E41:E1 8D F8 07 8D F9 07 AD 51
0E49:BD 0E 18 6D BC 0E 8D BD 98
0E51:0E 29 08 4A 4A 4A 8D BB B6
0E59:0E 18 6D F8 07 8D F8 07 27
0E61:AD F8 07 8D F9 07 AD C0 54
0E69:0E 0A 18 69 E1 8D FA 07 EA
0E71:8D FB 07 AD BF 0E 18 6D E2
0E79:BE 0E 8D BF 0E 29 08 4A 95
0E81:4A 4A 8D BB 0E 18 6D FA 69
0E89:07 8D FA 07 AD FA 07 8D 51
0E91:FB 07 AD 6B 0F F0 08 A9 CF
0E99:E5 8D F8 07 8D F9 07 AD AB
0EA1:6C 0F F0 08 A9 E6 8D FA 55
0EA9:07 8D FB 07 EA 60 00 00 75
0EB1:00 00 00 00 00 00 00 00 CD
0EB9:00 00 00 00 00 00 00 00 D5
0EC1:00 4C D1 14 AD 11 08 D0 FE
0EC9:F8 AD B0 0E 29 04 D0 0E CD
0ED1:CE B7 0E A9 01 8D BE 0E 69
0ED9:A9 00 8D C0 0E 60 AD B0 86
0EE1:0E 29 08 D0 0E EE B7 0E 07
0EE9:A9 01 8D BE 0E A9 01 8D 5F
0EF1:C0 0E 60 A9 00 8D BE 0E 5A
0EF9:60 A9 00 8D 6F 0F 8D 70 CC
0F01:0F AD 6B 0F F0 0A AA BD 33
0F09:40 0F 8D 6F 0F CE 6B 0F 4D
0F11:EA AD 6C 0F F0 0A AA BD 51
0F19:40 0F 8D 70 0F CE 6C 0F 6F
0F21:AD 6B 0F D0 0A AD 6E 0F D2
0F29:F0 05 A9 28 8D 6B 0F AD 9E
0F31:6C 0F D0 0A AD 6D 0F F0 36
0F39:05 A9 28 8D 6C 0F 60 00 82
0F41:00 04 08 0B 0E 11 14 17 06
0F49:19 1B 1D 1F 21 22 23 24 4C
0F51:25 26 26 26 26 25 24 23 E3
0F59:22 21 1F 1D 1B 17 14 11 F4
0F61:0E 0B 08 04 00 00 00 00 8A
0F69:00 00 00 00 00 00 00 00 87
0F71:00 00 A9 00 8D 71 0F 4C 61
0F79:11 0F A9 00 8D 72 0F 4C B9
0F81:21 0F AD B7 0E C9 01 B0 6F
0F89:05 A9 01 8D B7 0E AD B7 96
0F91:0E C9 21 90 05 A9 21 8D F4
0F99:B7 0E EA AD B3 0E C9 4F 08
0FA1:B0 05 A9 4F 8D B3 0E AD 88
0FA9:B3 0E C9 6F 90 05 A9 6F B0
0FB1:8D B3 0E 60 00 00 00 8C D7
0FB9:00 00 00 7D AD BB 0F 18 42
0FC1:6D B9 0F 8D BB 0F AD BC F1
0FC9:0F 6D BA 0F 8D BC 0F AD 3E
0FD1:BC 0F 18 69 32 C9 33 B0 7B
0FD9:21 A9 00 8D A4 15 A9 02 9A
0FE1:8D BC 0F 20 39 11 A9 00 3B
0FE9:38 ED B9 0F 8D B9 0F A9 E2
0FF1:00 ED BA 0F 8D BA 0F 4C 95
0FF9:20 10 AD BC 0F C9 90 90 FE
1001:1E A9 00 8D A3 15 A9 8F C7
1009:8D BC 0F 20 39 11 A9 00 64
1011:38 ED B9 0F 8D B9 0F A9 0C
1019:00 ED BA 0F 8D BA 0F 4C BE
1021:55 10 AD BB 0F 8D 7A 0A 0F
1029:AD BC 0F 8D 7B 0A AD B7 21
1031:0F 8D 78 0A AD B8 0F 8D E7
1039:79 0A A0 04 20 56 08 20 77
1041:2E 08 EE 38 11 AD 38 11 9C
1049:4A 4A 4A 29 03 18 69 E7 30
1051:8D FC 07 60 AD 37 15 D0 A3
1059:11 AD B5 0F 18 69 03 8D 0F
1061:B5 0F AD B6 0F 69 00 8D EC
1069:B6 0F AD B7 0F 18 6D B5 43
1071:0F 8D B7 0F AD B8 0F 6D 40
1079:B6 0F 8D B8 0F AD B8 0F A5
1081:C9 A0 90 30 A9 9F 8D B8 63
1089:0F 20 39 11 A9 00 38 ED 1D
1091:B5 0F 8D B5 0F A9 00 ED 6A
1099:B6 0F 8D B6 0F AD BC 0F AD
10A1:C9 46 90 08 A9 00 8D A2 D5
10A9:15 4C B2 10 A9 01 8D A2 CD
10B1:15 20 38 15 AD B8 0F C9 F4
10B9:0E B0 19 A9 0F 8D B8 0F F9
10C1:20 39 11 A9 00 38 ED B5 6F
10C9:0F 8D B5 0F A9 00 ED B6 5C
10D1:0F 8D B6 0F 60 A9 42 A2 75
10D9:00 20 E6 10 A2 26 20 E6 B4
10E1:10 20 23 11 60 9D 50 04 A5
10E9:9D 78 04 9D A0 04 9D C8 6A
10F1:04 9D F0 04 9D 18 05 9D CE
10F9:40 05 9D 68 05 9D 90 05 7A
1101:9D B8 05 9D E0 05 9D 08 F8
1109:06 9D 30 06 9D 58 06 9D F3
1111:80 06 9D A8 06 9D D0 06 81
1119:9D F8 06 9D 20 07 9D 48 83
1121:07 60 A9 63 A2 26 9D 70 A3
1129:07 CA 10 FA A9 64 A2 26 7D
1131:9D 28 04 CA 10 FA 60 00 86
1139:EA A9 8F 8D 18 D4 A9 10 7D
1141:8D 05 D4 8D 13 D4 A9 64 82
1149:8D 06 D4 A9 5A 8D 14 D4 EE
1151:A9 10 8D 12 D4 A9 15 8D 24
1159:04 D4 A9 18 8D 01 D4 A9 2D
1161:0D 8D 0F D4 20 73 11 A9 37
1169:14 8D 04 D4 A9 10 8D 12 81
1171:D4 60 A2 00 A0 02 88 D0 59
1179:FD CA D0 F8 60 60 A9 00 CE
1181:8D 37 15 A9 8F 8D 18 D4 2D
1189:A9 10 8D 05 D4 8D 13 D4 5E
1191:A9 64 8D 06 D4 A9 5A 8D 43
1199:14 D4 A9 10 8D 12 D4 A9 39
11A1:15 8D 04 D4 A9 10 8D 01 29
11A9:D4 A9 05 8D 0F D4 20 73 99
11B1:11 A9 10 8D 04 D4 A9 10 78
11B9:8D 12 D4 60 AD BA 0F 29 67
11C1:80 D0 1C AD BC 0F C9 44 B0
11C9:90 31 C9 48 B0 2D AD B8 8C
11D1:0F C9 4B 90 26 C9 82 B0 6E
11D9:23 20 7F 11 4C 0F 12 AD 07
11E1:BC 0F C9 49 90 15 C9 4D AD
11E9:B0 11 AD B8 0F C9 4B 90 B0
11F1:0A C9 82 B0 10 20 7F 11 F7
11F9:4C 0F 12 60 A9 01 8D A2 5D
1201:15 20 38 15 60 A9 00 8D 47
1209:A2 15 20 38 15 60 A9 00 C8
1211:38 ED B9 0F 8D B9 0F A9 10
1219:00 ED BA 0F 8D BA 0F 60 D6
1221:FE FE FE FE FE FF FF FF 4C
1229:FF 00 00 00 00 00 00 00 4D
1231:01 01 01 01 01 B0 B5 CE 4B
1239:E2 F6 F8 FA FF FF 01 01 5E
1241:06 08 0A 1E 32 4B 50 09 F5
1249:14 50 20 76 12 AD BA 0F C2
1251:C9 03 F0 15 C9 04 F0 11 DB
1259:C9 05 F0 0D C9 FD F0 0F C9
1261:C9 FC F0 0B C9 FB F0 07 9F
1269:60 A9 02 8D BA 0F 60 A9 BD
1271:FE 8D BA 0F 60 AD B6 0F F6
1279:C9 05 F0 15 C9 06 F0 11 8C
1281:C9 07 F0 0D C9 FB F0 0F 6A
1289:C9 FA F0 0B C9 F9 F0 07 3F
1291:60 A9 04 8D B6 0F 60 A9 06
1299:FC 8D B6 0F 60 00 00 FF 6A
12A1:FF FF FF FF FF FF FF FF C5
12A9:FF FF FF FF FF FF FF FF CD
12B1:FF 00 00 00 00 00 00 00 D5
12B9:00 00 00 00 00 00 00 00 DD
12C1:00 00 00 00 00 00 00 00 E5
12C9:FC FD FD FE FE FE FE FF 8D
12D1:FF FF FF FF FF FF FF FF F5
12D9:FF FF 00 00 00 00 00 00 FD
12E1:00 00 00 00 00 01 01 01 0D
12E9:01 02 02 03 00 00 00 AD 2D
12F1:B6 0F 30 65 AD B8 0F 18 18
12F9:6D 70 0F 29 F8 C9 90 D0 46
1301:59 AD BC 0F 18 69 0A 38 7A
1309:ED B7 0E AA E0 00 90 4A F2
1311:E0 14 B0 46 A9 00 38 ED D2
1319:B5 0F 8D B5 0F A9 00 ED F7
1321:B6 0F 8D B6 0F AD B9 0F 35
1329:18 7D 36 12 8D B9 0F AD C1
1331:BA 0F 7D 21 12 8D BA 0F 85
1339:AE 6C 0F AD B5 0F 38 FD E6
1341:9E 12 8D B5 0F AD B6 0F F3
1349:FD C7 12 8D B6 0F EE A3 EE
1351:15 A9 00 8D A4 15 20 7F 7E
1359:11 60 AD B6 0F 30 65 AD F2
1361:B8 0F 18 6D 70 0F 29 F8 8C
1369:C9 90 D0 59 AD BC 0F 38 FE
1371:E9 16 38 ED B7 0E AA E0 24
1379:00 90 4A E0 14 B0 46 A9 B4
1381:00 38 ED B5 0F 8D B5 0F F7
1389:A9 00 ED B6 0F 8D B6 0F D8
1391:AD B9 0F 18 7D 36 12 8D D6
1399:B9 0F AD BA 0F 7D 21 12 84
13A1:8D BA 0F AE 6C 0F AD B5 BA
13A9:0F 38 FD 9E 12 8D B5 0F 50
13B1:AD B6 0F FD C7 12 8D B6 76
13B9:0F EE A3 15 A9 00 8D A4 F5
13C1:15 20 7F 11 60 AD B6 0F B1
13C9:30 65 AD B8 0F 18 6D 6F C5
13D1:0F 29 F8 C9 90 D0 59 AD AD
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How to Type In COMPUTE!'s GAZETTE Programs," elsewhere in this issue.

```
13D9:BC 0F 18 69 0A 38 ED B3 7C
13E1:0E AA E0 00 90 4A E0 14 59
13E9:B0 46 A9 00 38 ED B5 0F 23
13F1:8D B5 0F A9 00 ED B6 0F FC
13F9:8D B6 0F AD B9 0F 18 7D 09
1401:36 12 8D B9 0F AD BA 0F C9
1409:7D 21 12 8D BA 0F AE 6B 2E
1411:0F AD B5 0F 38 FD 9E 12 DC
1419:8D B5 0F AD B6 0F FD C7 E7
1421:12 8D B6 0F EE A4 15 A9 5B
1429:00 8D A3 15 20 7F 11 60 FB
1431:AD B6 0F 30 65 AD B8 0F 25
1439:18 6D 6F 0F 29 F8 C9 90 F8
1441:D0 58 AD BC 0F 38 E9 16 AC
1449:38 ED B3 0E AA E0 00 90 C9
1451:49 E0 14 B0 45 A9 00 38 EC
1459:ED B5 0F 8D B5 0F A9 00 DD
1461:ED B6 0F 8D B6 0F AD B9 EF
1469:0F 18 7D 36 12 8D B9 0F 7B
1471:AD BA 0F 7D 21 12 8D BA FF
1479:0F AE 6B 0F AD B5 0F 38 CD
1481:FD 9E 12 8D B5 0F AD B6 67
1489:0F FD C7 12 8D B6 0F EE 27
1491:A4 15 A9 00 8D A3 15 20 CB
1499:7F 11 60 AD B6 0F 30 2E 2D
14A1:AD B8 0F 29 FC C9 4C D0 BB
14A9:25 AD BC 0F C9 44 90 1E F6
14B1:C9 4C B0 1A 4E B6 0F 6E 63
14B9:B5 0F 20 7F 11 A9 00 38 E3
14C1:ED B5 0F 8D B5 0F A9 00 46
14C9:ED B6 0F 8D B6 0F 60 00 04
14D1:AD 08 DC 29 1F 69 14 CD 95
14D9:BC 0F 90 4D AD BC 0F 38 C1
14E1:E9 06 CD B7 0E F0 1F B0 D8
14E9:10 CE B7 0E A9 01 8D BE D0
14F1:0E A9 00 8D C0 0E 4C 07 42
14F9:15 EE B7 0E A9 01 8D BE 6B
1501:0E A9 01 8D C0 0E AD B8 E7
1509:0F C9 7C 90 1B AD BA 0F D9
1511:29 80 8D BB 0E AD BC 0F 0D
1519:38 ED B7 0E 29 80 4D BB 54
1521:0E D0 05 A9 01 8D 6D 0F E9
1529:60 AD BC 0F 38 E9 16 CD DA
1531:B7 0E B0 C5 90 B3 01 AD 30
1539:D8 15 CD A2 15 D0 03 20 0B
1541:D9 15 AD A2 15 8D D8 15 23
1549:A9 00 8D B9 0F 8D BA 0F C8
1551:8D B5 0F 8D B6 0F 20 C6 63
1559:15 AD 11 08 F0 16 A9 08 57
1561:8D B7 0E A9 00 8D 6D 0F BC
1569:8D 6C 0F 8D B6 0E 8D BB F4
1571:0F 8D B7 0F A9 00 8D A3 7A
1579:15 8D A4 15 AD A2 15 F0 8A
1581:10 A9 01 8D 37 15 A9 8C 05
1589:8D B8 0F A9 7D 8D BC 0F CF
1591:60 A9 01 8D 37 15 A9 8C 3D
1599:8D B8 0F A9 14 8D BC 0F 94
15A1:60 01 00 00 AD A3 15 C9 2C
15A9:04 F0 08 AD A4 15 C9 04 FE
15B1:F0 0A 60 A9 01 8D A2 15 16
15B9:20 38 15 60 A9 00 8D A2 B5
15C1:15 20 38 15 60 A9 00 8D 0E
15C9:D7 15 20 73 11 CE D7 15 E8
15D1:AD D7 15 D0 F5 60 00 01 AA
15D9:AD A2 15 D0 0E EE 5E 16 32
15E1:20 FA 15 AD 5E 16 C9 0F 46
15E9:F0 75 60 EE 5F 16 20 FA 73
15F1:15 AD 5F 16 C9 0F F0 67 33
15F9:60 A9 05 20 D2 FF A2 00 3D
1601:A0 01 18 20 F0 FF AD 5E 04
1609:16 C9 0A 90 32 A9 31 20 B7
1611:D2 FF AD 5E 16 38 E9 0A B1
1619:18 69 30 20 D2 FF A2 00 8F
1621:A0 24 18 20 F0 FF AD 5F ED
1629:16 C9 0A 90 22 A9 31 20 57
1631:D2 FF AD 5F 16 38 E9 0A E1
1639:18 69 30 20 D2 FF 60 A9 D4
1641:30 20 D2 FF AD 5E 16 69 64
1649:30 20 D2 FF 4C 1F 16 A9 A4
1651:30 20 D2 FF AD 5F 16 69 78
1659:30 20 D2 FF 60 00 00 A9 AC
1661:01 8D 66 16 60 00 41 52 77
1669:43 41 44 45 20 56 4F 4C A9
1671:4C 45 59 42 41 4C 4C 00 38
1679:47 4F 20 41 4D 49 47 41 94
1681:21 00 00 00 00 00 00 00 3E
```

Ramdisk 64

See instructions in article on page 44 before typing in.

```
0801:0C 08 2E 04 9E 32 30 36 73
0809:38 3A 00 12 08 38 04 80 8E
0811:00 00 00 A0 08 A9 4C 99 44
0819:2B 00 A9 0B 99 2C 00 88 AA
0821:88 10 F2 AD 00 03 AC 01 19
0829:03 8D 4C 08 8C 4D 08 A9 7B
0831:45 A0 08 8D 00 03 8C 01 0C
0839:03 A9 00 8D 00 A0 8D 01 AC
0841:A0 4C 74 A4 A5 3A C9 FF 37
0849:F0 06 4C FF FF 4C 83 09 1E
0851:E0 09 D0 F6 A4 B7 D0 04 47
0859:A2 08 D0 EE AD 00 02 C9 01
0861:93 F0 EA C9 94 D0 E3 20 41
0869:8F F6 20 31 09 38 A5 2D B7
0871:E5 2B 85 02 A5 2E E5 2C ED
0879:85 03 A0 00 A5 05 C9 D0 C6
0881:B0 01 C8 18 A5 04 65 02 CE
0889:A5 05 65 03 B0 05 D9 F5 CD
0891:08 90 08 20 31 09 A2 10 CF
0899:4C 4B 08 A5 B7 C9 11 90 95
08A1:02 A9 10 A8 A9 00 F0 02 DA
08A9:B1 BB C8 C8 91 04 88 88 5D
08B1:88 10 F5 A4 B7 C8 C8 C8 4E
08B9:98 18 65 04 85 08 A5 05 A5
08C1:69 00 85 09 A9 4C 85 06 57
08C9:A9 0B 85 07 A5 04 85 0A E4
08D1:A5 05 85 0B 20 45 09 A0 20
08D9:00 A5 08 85 04 91 0A C8 EF
08E1:A5 09 85 05 91 0A C8 A9 F7
08E9:00 91 04 88 10 FB 20 31 49
08F1:09 4C 74 A4 FF EF 93 20 79
08F9:20 20 20 20 20 20 20 20 0A
0901:20 20 20 20 20 20 12 52 29
0909:41 4D 44 49 53 4B 36 34 94
0911:92 20 20 20 20 0D 0D 00 C9
0919:20 42 59 54 45 53 20 46 3A
0921:52 45 45 2E 00 00 00 A0 D9
0929:00 00 00 00 00 00 00 00 3B
0931:A0 09 B9 02 00 AA B9 25 70
0939:09 99 02 00 8A 99 25 09 84
0941:88 10 EF 60 20 74 09 A0 25
0949:00 A6 02 D0 07 C6 03 10 BB
0951:03 4C 7A 09 C6 02 B1 06 7F
0959:91 08 A2 02 F6 06 D0 0C 28
0961:F6 07 B5 07 C9 D0 D0 04 0F
0969:A9 E0 95 07 CA CA 10 EC 3A
0971:4C 4A 09 78 C6 01 C6 01 AD
0979:60 E6 01 E6 01 58 60 4C 7A
0981:34 0A 20 D2 F5 20 31 09 FC
0989:A4 B7 C0 01 D0 F1 A0 00 93
0991:B1 BB C9 24 D0 E9 A0 00 56
0999:B9 F7 08 F0 06 20 D2 FF EC
09A1:C8 D0 F5 A9 00 A0 A0 85 EE
09A9:06 84 07 20 74 09 A0 01 CC
09B1:B1 06 99 0A 00 88 10 F8 2D
09B9:A5 0B F0 3A A0 01 A9 22 A1
09C1:D0 08 B1 06 D0 04 A9 22 E0
09C9:A0 FF 20 7A 09 20 D2 FF 46
09D1:20 74 09 C8 D0 EC 20 7A B3
09D9:09 38 20 F0 FF C0 14 B0 6D
09E1:09 A0 14 18 20 F0 FF 4C B5
09E9:F0 09 A9 0D 20 D2 FF A5 AE
09F1:0A A4 0B 4C A8 09 20 7A 7C
09F9:09 A0 0C A9 0D 2C A9 20 61
0A01:20 D2 FF 88 D0 F8 38 A9 E6
0A09:FF E5 06 AA 08 A5 07 C9 B0
0A11:D0 90 05 28 A9 FF 30 03 85
0A19:28 A9 EF E5 07 20 CD BD 1A
0A21:A0 00 B9 19 09 20 D2 FF BC
0A29:C8 C0 0C D0 F5 20 31 09 FB
0A31:4C 74 A4 20 74 09 A9 00 3A
0A39:A0 A0 85 06 84 07 A0 01 59
0A41:B1 06 99 0A 00 88 10 F8 BE
0A49:A5 0B D0 03 4C 00 00 00 9F
```

Graphics Wedge

See instructions in article on page 54 before typing in.

```
0801:0D 08 0A 00 9E 28 32 30 05
0809:36 33 29 00 00 00 A2 08 73
0811:A0 56 84 FB 86 FC A2 C9 8E
0819:A0 34 84 FD 86 FE A2 02 6E
0821:A0 00 B1 FB 91 FD C8 D0 5E
0829:F9 E6 FC E6 FE CA D0 F2 B5
0831:B1 FB 91 FD C8 C0 CC D0 DE
0839:F7 AE 08 03 AC 09 03 8E 40
0841:40 C9 8C 41 C9 A2 34 A0 6B
0849:C9 8E 08 03 8C 09 03 20 C1
0851:44 A6 4C 7B E3 C9 FF D0 85
0859:07 AD 00 02 C9 2E F0 03 64
0861:4C FF FF 20 73 00 A9 73 FB
0869:A0 CB 20 1E AB 20 E4 FF 4A
0871:F0 FB C9 42 D0 03 4C 7E FF
0879:C9 C9 43 D0 03 4C BE C9 E6
0881:C9 44 D0 03 4C D7 C9 C9 F0
0889:4B D0 03 4C FC C9 C9 4D 88
0891:D0 03 4C 2D CA C9 50 D0 16
0899:03 4C 8C CA 4C 7B E3 A2 37
08A1:C0 A0 00 84 FB 86 FC A2 19
08A9:80 A0 00 20 53 CB A2 C4 F7
08B1:A0 00 84 FB 86 FC A2 D8 A8
08B9:A0 00 20 53 CB A2 01 A0 DE
08C1:08 20 3C CB A5 01 29 FE A4
08C9:85 01 AD 80 BF 8D 21 D0 E1
08D1:AD 7F BF 8D 20 D0 A5 01 F9
08D9:09 01 85 01 4C E2 CA A2 95
08E1:C0 A0 00 84 FB 86 FC A2 59
08E9:80 A0 00 20 53 CB A2 01 74
08F1:A0 08 20 2D CB 4C DE C9 42
08F9:A2 02 A0 78 20 2D CB 20 E4
0901:E4 FF C9 00 F0 F9 C9 85 47
0909:D0 06 EE 20 D0 4C DE C9 24
0911:C9 89 D0 06 CE 20 D0 4C C9
0919:DE C9 4C 11 CB A2 7F A0 30
0921:40 84 FB 86 FC A2 40 A0 EF
0929:00 20 53 CB A2 83 A0 28 F6
0931:84 FB 86 FC A2 D8 A0 00 DE
0939:20 53 CB A2 02 A0 08 20 96
0941:3C CB AD 10 87 8D 21 D0 A0
0949:8D 20 D0 4C E2 CA A2 18 A8
0951:A0 F0 84 FB 86 FC A2 5C 0A
0959:A0 00 20 53 CB A2 1C A0 B6
0961:D8 84 FB 86 FC A2 D8 A0 AD
0969:00 20 53 CB A2 20 A0 C0 42
0971:84 FB 86 FC A2 60 A0 00 3D
0979:84 FD 86 FE A2 02 A0 78 E4
0981:20 3C CB AD DC 18 8D 21 8A
0989:D0 AD DD 18 8D 20 D0 A2 DD
0991:1F A0 00 B1 FB 91 FD C8 61
0999:D0 F9 E6 FC E6 FE CA D0 D8
09A1:F2 B1 FB 91 FD C8 C0 40 07
09A9:D0 F7 4C E2 CA A2 02 A0 5F
09B1:80 20 2D CB A9 10 A2 60 A1
09B9:A0 00 84 FD 86 FE A2 03 05
09C1:A0 00 91 FD C8 D0 FB E6 9E
09C9:FE CA D0 F6 91 FD C8 C0 6E
09D1:E8 D0 F9 20 E4 FF C9 00 88
09D9:F0 F9 C9 85 D0 06 EE 20 11
09E1:D0 4C B2 CA C9 89 D0 06 8E
09E9:CE 20 D0 4C B2 CA C9 86 25
09F1:D0 05 A9 01 4C 95 CA C9 0B
09F9:8A D0 05 A9 10 4C 95 CA 68
0A01:4C 11 CB 20 E4 FF C9 00 B5
0A09:F0 F9 C9 85 D0 06 EE 20 42
0A11:D0 4C E2 CA C9 89 D0 06 C5
0A19:CE 20 D0 4C E2 CA C9 86 D7
0A21:D0 06 EE 21 D0 4C E2 CA 57
```

```
0A29:C9 8A D0 06 CE 21 D0 4C 28
0A31:E2 CA A9 93 20 D2 FF A9 CD
0A39:97 8D 00 DD A9 15 8D 18 2F
0A41:D0 A9 C8 8D 16 D0 A9 1B 7C
0A49:8D 11 D0 4C 7B E3 8E 00 CF
0A51:DD 8C 18 D0 AD 11 D0 09 E3
0A59:20 8D 11 D0 60 8E 00 DD 2B
0A61:8C 18 D0 AD 16 D0 09 10 CC
0A69:8D 16 D0 AD 11 D0 09 20 BC
0A71:8D 11 D0 60 84 FD 86 FE D8
0A79:A2 03 A0 00 B1 FB 91 FD 52
0A81:C8 D0 F9 E6 FC E6 FE CA 28
0A89:D0 F2 B1 FB 91 FD C8 C0 8F
0A91:E8 D0 F7 60 93 11 8E 47 98
0A99:52 41 50 48 49 43 53 20 D3
0AA1:57 45 44 47 45 0D 28 43 A1
0AA9:29 31 39 38 38 20 43 4F 61
0AB1:4D 50 55 54 45 21 20 50 AF
0AB9:55 42 2E 2C 20 49 4E 43 97
0AC1:0D 11 20 42 2E 20 42 4C 8B
0AC9:41 5A 49 4E 47 20 50 41 BF
0AD1:44 44 4C 45 53 0D 11 20 08
0AD9:43 2E 20 43 41 44 50 41 50
0AE1:4B 0D 11 20 44 2E 20 44 62
0AE9:4F 4F 44 4C 45 0D 11 20 67
0AF1:4B 2E 20 4B 4F 41 4C 41 49
0AF9:0D 11 20 4D 2E 20 4D 49 87
0B01:43 52 4F 20 49 4C 4C 55 A2
0B09:53 54 52 41 54 4F 52 0D CD
0B11:11 20 50 2E 20 50 52 49 D4
0B19:4E 54 20 53 48 4F 50 0D D1
0B21:00 00 00 00 00 00 00 00 37
```

Jericho

See instructions in article on page 66 before typing in.

```
0801:0B 08 FF FF 9E 32 30 39 EF
0809:39 00 31 08 FF FF 8F 14 8F
0811:14 14 14 14 14 14 14 14 21
0819:43 20 31 39 38 38 20 43 B2
0821:4F 4D 50 55 54 45 20 50 D3
0829:55 42 4C 2E 20 20 20 00 A2
0831:00 00 20 44 0D 20 C3 0D 07
0839:20 63 08 20 3E 0A 20 63 F2
0841:08 20 3E 0A 20 63 08 20 84
0849:03 09 20 49 0A 20 BC 0A 0A
0851:20 7F 0B 20 18 0D 20 33 1D
0859:0D 20 BC 0A 20 28 0E 4C 3A
0861:39 08 AD 00 DC 29 0F C9 39
0869:0F F0 11 C9 0D D0 03 4C F9
0871:91 0C C9 0E D0 03 4C 0A 9C
0879:0C 4C 3E 0A A5 C5 C9 40 23
0881:F0 F7 C9 02 D0 03 4C 91 1E
0889:0C C9 07 D0 EC 4C 0A 0C B8
0891:A5 FB 38 E9 28 85 FB B0 19
0899:02 C6 FC 60 A5 FB 18 69 B8
08A1:28 85 FB 90 02 E6 FC 60 B5
08A9:A9 D8 85 FC A9 00 85 FB 99
08B1:A0 00 A9 07 91 FB C8 D0 96
08B9:FB E6 FC A5 FC C9 DC 90 D4
08C1:F1 60 A9 04 85 FC A9 F6 C2
08C9:85 FB A9 DB A0 00 91 FB B2
08D1:C8 C0 1C 90 F9 20 9D 08 96
08D9:A5 FC C9 06 90 EC A5 FB 15
08E1:C9 F1 90 E6 A9 39 8D 43 64
08E9:0B 8D 26 04 A0 00 A9 01 41
08F1:99 00 D8 C8 C0 28 90 F8 37
08F9:A9 00 A8 99 00 D4 C8 D0 43
0901:FA 60 AC BF 02 8C 27 0E D8
0909:AD BC 02 85 FB 85 FD AD 59
0911:BD 02 85 FC 85 FE B1 FB 8A
0919:C9 A0 D0 07 A9 E0 91 FB B2
0921:4C 28 09 A9 20 91 FB AD 0C
0929:AB 02 F0 09 20 D0 09 20 B6
0931:8C 09 4C 3C 09 20 E4 09 B4
0939:20 8C 09 AD AF 02 D0 3B DC
0941:AD AA 02 D0 0C 20 91 08 2E
0949:20 AE 09 20 1E 0A 4C 5B 47
0951:09 20 9D 08 20 AE 09 20 12
0959:2E 0A AD AC 02 D0 24 8C AD
0961:BF 02 AC 27 0E A9 20 91 C4
0969:FD AC BF 02 A9 51 91 FB 6F
0971:A5 FB 8D BC 02 A5 FC 8D 01
0979:BD 02 60 A9 00 8D AF 02 29
0981:4C 28 09 A9 00 8D AC 02 11
0989:4C 41 09 B1 FB C9 20 D0 66
0991:05 C9 20 D0 01 60 AD AB 3A
0999:02 49 FF 8D AB 02 B1 FB 9C
09A1:C9 A0 D0 08 A9 01 8D AF 77
09A9:02 20 44 0B 60 B1 FB C9 89
09B1:20 D0 05 C9 20 D0 01 60 EB
09B9:AD AA 02 49 FF 8D AA 02 AF
09C1:B1 FB C9 A0 D0 08 20 44 1A
09C9:0B A9 01 8D AC 02 60 C0 B3
09D1:05 90 07 AD 1B D4 C9 2F 35
09D9:F0 01 C8 C0 28 D0 03 4C A0
09E1:F8 09 60 C0 23 B0 07 AD 62
09E9:1B D4 C9 FC B0 01 88 C0 23
09F1:FF D0 03 4C F8 09 60 AD B7
09F9:00 DC 29 10 F0 06 A5 C5 1A
0A01:C9 15 D0 F3 CE 43 0B AD DF
0A09:43 0B 8D 26 04 C9 30 D0 0E
0A11:03 4C 07 0B 20 83 0A 20 8E
0A19:E0 0D 4C 39 08 A5 FC C9 98
0A21:05 B0 09 A5 FB C9 28 B0 67
0A29:03 4C F8 09 60 A5 FC C9 DE
0A31:07 90 09 A5 FB C9 E8 90 D1
0A39:03 4C F8 09 60 A9 07 AA F3
0A41:A8 CA D0 FD 88 D0 FA 60 34
0A49:EE 32 0D AD 32 0D C9 03 3A
0A51:B0 01 60 A9 00 8D 32 0D 4C
0A59:A9 F6 85 FB A9 D8 85 FC 29
0A61:A0 00 AD 1B D4 29 0F F0 87
0A69:F9 91 FB C8 C0 1C 90 F2 75
0A71:A0 00 20 9D 08 A5 FC C9 4E
0A79:DA 90 E7 A5 FB C9 F2 90 F3
0A81:E1 60 A0 00 A9 20 99 28 DB
0A89:04 99 C0 07 C8 C0 28 90 B8
0A91:F5 A9 04 85 FC A9 27 85 46
0A99:FB A2 00 A9 20 A0 00 91 04
0AA1:FB C8 91 FB 20 9D 08 E8 48
0AA9:E0 18 90 EF 60 30 30 30 99
0AB1:30 30 30 30 30 30 30 30 C5
0AB9:30 30 30 A9 04 85 FC A9 6C
0AC1:F6 85 FB A0 00 B1 FB C9 C4
0AC9:20 D0 03 20 E6 0A C8 C0 36
0AD1:1C 90 F2 A0 00 20 9D 08 44
0AD9:A5 FC C9 06 90 E7 A5 FB 05
0AE1:C9 F1 90 E1 60 A2 0A FE 28
0AE9:AE 0A BD AE 0A C9 3A 90 F6
0AF1:09 A9 30 9D AE 0A CA 4C 54
0AF9:E8 0A BD AE 0A 9D 00 04 72
0B01:E8 E0 0B 90 F5 60 A2 00 A4
0B09:BD 25 0B F0 07 20 D2 FF 16
0B11:E8 4C 09 0B A5 C5 C9 40 98
0B19:F0 FA C9 3F F0 03 4C 36 F5
0B21:08 4C E2 FC 9A 13 11 50 0E
0B29:52 45 53 53 20 52 45 54 82
0B31:55 52 4E 20 54 4F 20 50 C2
0B39:4C 41 59 20 41 47 41 49 E5
0B41:4E 00 00 AD 1B D4 29 07 DE
0B49:AA BD C7 0B 8D BE 0B BD 09
0B51:BF 0B 8D BD 0B A9 08 8D 34
0B59:00 D4 8D 01 D4 8D 07 D4 26
0B61:8D 08 D4 A9 0F 8D 18 D4 29
0B69:A9 0F 8D 05 D4 8D 0C D4 E3
0B71:A9 FC 8D 06 D4 8D 0D D4 79
0B79:A9 15 8D 0B D4 60 AD BE 4E
0B81:0B 18 69 C8 8D BE 0B 90 EA
0B89:03 EE BD 0B AE BD 0B AD 75
0B91:BE 0B 8D 00 D4 18 69 0A 5F
0B99:8D 07 D4 8E 01 D4 90 01 39
0BA1:E8 8E 08 D4 AD BD 0B C9 62
0BA9:1E 90 08 A9 10 8D 04 D4 22
0BB1:8D 0B D4 60 00 C9 51 D0 8C
0BB9:02 A9 20 60 00 00 02 02 4B
0BC1:02 02 03 03 03 04 18 5A 9C
0BC9:A3 CC 23 86 F4 30 A2 00 5F
0BD1:A9 30 9D AE 0A E8 E0 0E 2B
0BD9:90 F6 60 A5 FB 18 69 28 97
0BE1:85 FB 90 02 E6 FC A5 FD 60
0BE9:38 E9 28 85 FD B0 02 C6 71
0BF1:FE 60 A5 FB 38 E9 28 85 53
0BF9:FB B0 02 C6 FC A5 FD 18 79
0C01:69 28 85 FD 90 02 E6 FE C1
0C09:60 AD 50 04 8D 12 0D AD 83
0C11:4F 04 8D 13 0D AD C1 07 5E
0C19:8D 14 0D AD BF 07 8D 15 C3
0C21:0D A0 26 A2 02 B9 28 04 22
0C29:8D 16 0D BD C0 07 CA C8 8B
0C31:9D C0 07 AD 16 0D 99 28 44
0C39:04 E8 E8 88 88 C0 FF D0 4B
0C41:E4 A0 00 A9 28 85 FB A9 87
0C49:04 85 FC A9 E7 85 FD A9 F9
0C51:07 85 FE A2 00 20 DC 0B 9D
0C59:A1 FB 8D 16 0D A1 FD 8D CC
0C61:17 0D 20 F3 0B AD 16 0D D3
0C69:81 FB AD 17 0D 81 FD 20 F2
0C71:DC 0B C8 C0 17 90 DE AD 46
0C79:12 0D 8D 28 04 AD 13 0D 1C
0C81:8D 77 04 AD 14 0D 8D C0 4A
0C89:07 AD 15 0D 8D E7 07 60 7E
0C91:AD 29 04 8D 12 0D AD 77 BB
0C99:04 8D 13 0D AD 98 07 8D B5
0CA1:14 0D AD E6 07 8D 15 0D D0
0CA9:A0 26 A2 02 B9 C0 07 8D 7C
0CB1:16 0D BD 28 04 CA C8 9D CC
0CB9:28 04 AD 16 0D 99 C0 07 55
0CC1:E8 E8 88 88 C0 FF D0 E4 AE
0CC9:A0 00 A9 C0 85 FB A9 07 E9
0CD1:85 FC A9 4F 85 FD A9 04 91
0CD9:85 FE A2 00 20 F3 0B A1 51
0CE1:FB 8D 16 0D A1 FD 8D 17 26
0CE9:0D 20 DC 0B AD 16 0D 81 3E
0CF1:FB AD 17 0D 81 FD 20 F3 5F
0CF9:0B C8 C0 17 90 DE AD 12 C0
0D01:0D 8D 28 04 AD 14 0D 8D AF
0D09:C0 07 AD 15 0D 8D E7 07 C1
0D11:60 00 00 00 00 00 00 A5 01
0D19:C5 C9 3C F0 01 60 A5 C5 B9
0D21:C9 40 D0 FA A5 C5 C9 3C 0E
0D29:D0 FA A5 C5 C9 40 D0 FA 67
0D31:60 00 AD 8D 02 D0 01 60 BF
0D39:A2 00 A0 20 CA D0 FD 88 D8
0D41:D0 FA 60 20 C3 0D A0 00 24
0D49:A9 A0 99 C0 07 99 28 04 92
0D51:C8 C0 28 90 F5 A9 28 85 3A
0D59:FB A9 04 85 FC A9 E7 85 98
0D61:FD A9 07 85 FE A2 00 A0 41
0D69:00 A9 A0 81 FB 81 FD 20 1C
0D71:DC 0B C8 C0 17 90 F2 A0 63
0D79:00 B9 86 0D F0 24 99 0C FA
0D81:04 C8 4C 7A 0D 0A 05 12 AD
0D89:09 03 08 0F 20 20 10 12 8E
0D91:05 13 13 20 06 09 12 05 D4
0D99:20 14 0F 20 13 14 01 12 A9
0DA1:14 00 20 03 09 20 BC 0A 46
0DA9:20 3E 0A 20 7F 0B 20 49 58
0DB1:0A 20 3E 0A AD 00 DC 29 91
0DB9:10 F0 06 A5 C5 C9 15 D0 83
0DC1:E1 60 A9 93 20 D2 FF A9 49
0DC9:8E 20 D2 FF A9 08 20 D2 0E
0DD1:FF A9 20 8D E8 07 20 A9 80
0DD9:08 20 C3 08 20 CF 0B 20 6F
0DE1:3A 0E A9 FF 8D AC 02 8D 82
0DE9:AB 02 8D AA 02 A9 06 8D 07
0DF1:BD 02 A9 D8 8D C1 02 A9 4F
0DF9:F6 8D C0 02 A9 80 8D 12 A7
0E01:D4 8D 0E D4 8D 0F D4 AD F9
0E09:1B D4 C9 08 90 F9 C9 1E BF
0E11:B0 F5 8D BF 02 A9 08 8D 05
0E19:BC 02 A0 00 8C C2 02 8C 28
0E21:21 D0 8C 20 D0 60 00 AD 4B
0E29:28 04 C9 A0 D0 0A AD 50 F7
0E31:04 C9 20 D0 03 20 3A 0E ED
0E39:60 A0 00 A9 A0 99 28 04 08
0E41:99 D4 07 A9 20 99 3C 04 BE
0E49:99 C0 07 C8 C0 14 90 EB 33
0E51:A9 28 85 FB A9 04 85 FC 22
0E59:A9 E7 85 FD A9 07 85 FE 48
0E61:A2 00 A0 00 20 DC 0B A9 17
0E69:20 81 FB 81 FD C8 C0 17 39
0E71:90 F2 60 00 00 00 00 00 9E
```

Jump On The TENEX Express

No Gimmicks, No Hidden Charges, No Nonsense, Just Low Prices and Great Service!

FREE

DUST COVER & EVERYTHING BOOK

Discover the savings and easy shopping available from TENEX Computer Express PLUS receive a **FREE** dust cover for your C64, C128 or 64C! Cover is anti-static, 8-gauge vinyl sewn to our exacting standards with reinforced seams. Get to know our great products, extensive selection and fast service with a **FREE** copy of our *Everything Book for Commodore Computing.* ($2.95 Shipping Charge)

31627	C-64 Dust Cover and Catalog	(G40)
38464	C-128 Dust Cover and Catalog	(G40)
65180	64C Dust Cover and Catalog	(G40)

Hardware Specials

FDS-2 Disk Drive	$159.00	Epyx 500XJ Joystick	$15.95
Excel 2001 Disk Drive	$209.00	Star NX-1000	$CALL
13-inch Color Monitor	$159.95	Star NX-1000C	$CALL
Pow'r Pak 64	$39.95	Star NX-Rainbow Color Printer	$CALL
Pow'r Pak 128	$59.95	NEW! Commodore 128D Computer	$CALL
Okidata 180 Printer	$224.95	Commodore 1571 Disk Drive	$CALL
Okidata 120 Printer	$189.95	Commodore 1581 Disk Drive	$CALL
Okimate 20 Color Printer	$124.95	Commodore 2002 Monitor	$CALL
Seikosha SP-180VC	$149.95	Commodore 1351 Mouse	$33.95
Seikosha SP-1000VC	$189.95	1750 RAM Expansion- 512 K Cartridge, C128	$179.95
Super Graphix	$59.95	1764 RAM Expansion- 256K Cartridge, C64	$124.95
Super Graphix Jr.	$44.95	C128 Computer System	$CALL
Super Graphix Gold	$CALL		
IconTroller	$17.95		

Software Specials

GEOS-64	$39.95	GEOS-128	$49.95
geoPublish	$44.95	geoFile	$32.95
geoCalc	$32.95	Writier's Workshop-64	$32.95
Deskpack	$24.95	Writer's Workshop-128	$49.95
Basic 8	$33.95	Echelon	$26.95

Free! 52 "Page Everything" Book With Any Order!

From **microLat®** ...

THE 39¢ DISKETTE!

Are you paying too much for diskettes? Try our first quality, prime, 5 1/4" diskettes (no rejects, no seconds) at these fantastic sale prices and save, save, SAVE! Disks are packaged in boxes of 50; including diskettes in sleeves, labels, and write-protect tabs.

Each diskette is certified to be 100% error free and comes with a lifetime warranty (if you have a problem, we'll replace the diskette). All diskettes include hub reinforcement rings and write-protect notch.

All diskettes are double density and work in either single or double density drives.

SS, DD Diskettes, Box of 50
32391 $19.50 - 39¢ ea.!

DS, DD Diskettes, Box of 50
32403 $24.50 - 49¢ ea.!

Super Deal On Diskette Storage!

Only $9.95

- A whopping 100 disk (5 1/4") capacity.
- Lock and keys for extra security and easy carrying.
- Includes 8 index dividers with labels for organization of filing and retrieval.
- Made of durable anti-static, high impact plastic.
- Attractive smoked color lid.

Sug. Retail $19.95
66826 NOW ONLY $9.95

Unleash The Power of CP/M™ On Your C128!

ONLY $22.95

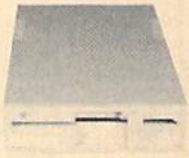
Includes Free CP/M Programs
• Word Processor • Disk Utilities • Communications

CP/M Kit includes a helpful guide to using CP/M such as: stressing the unique features of Commodore's CP/M, using your 1541 or 1571 drive with CP/M, and using your modem to access electronic bulletin boards that offer free, downloadable software.

67392 2 Disks & Manual for C128 **$22.95**

$159

FSD-2 Disk Drive



Reviewed by *RUN Magazine:*
"...higher-than-average quality...10% faster than a 1541...half the size...you can rest assured that the FSD-2 will do a fine job for you."

Runs all C64 Commercial Software.
Full 1 Year Warranty.

66166 Disk Drive **$159**

"THE BEST PRICES"
"THE BEST SERVICE"
WHY SHOP ANYWHERE ELSE?

THE FAMOUS SLIK STIK™ Only $6.95!

The Slik Stik™ has been a favorite for years... and for good reason. It's just the right combination of responsiveness and accuracy. And the price can't be beat! From Suncom. 90 day warranty. Connects directly to Commodore Computers.

42086 $6.95

From Your Friends At

TENEX Computer Express

We gladly accept mail orders!
P.O. Box 6578
South Bend, IN 46660

Ad G40

Questions?
Call 219/259-7051

Shipping Charges

Order Amount	Charge
less than $20.00	$3.75
$20.00-$39.99	4.75
$40.00-$74.99	5.75
$75.00-$149.99	6.75
$150.00-$299.99	7.75
$300.00 & up	8.75

MasterCard · VISA

NO EXTRA FEE FOR CHARGES

WE VERIFY CHARGE CARD ADDRESSES

ORDER TOLL FREE
1-800-348-2778

INDIANA ORDER LINE 1-800-225-6838

COMMODORE 64 is a registered trademark; and COMMODORE 128 is a trademark of Commodore Electronics, Ltd. APO, FPO, AK, HI, CN, VI, GU, and foreign orders are subject to additional shipping charges. NOTE: Due to publishing lead-times, product prices and specifications are subject to change without notice.

SOFTWARE DISCOUNTERS OF AMERICA

S.D. of A.

For Orders Only — 1-800-225-7638
PA Orders — 1-800-223-7784
Customer Service 412-361-5291

- Free shipping on orders over $100 in continental USA
- No Surcharge for VISA/MasterCard
- Your card is not charged until we ship

Commodore 64/128 Bargain Basement—Dozens of Titles For Less Than $10!

INFOCOM

Every bit as outrageous and funny as the novel.

Hitchhiker's Guide to the Galaxy
Our Discount Price $9.88

ACCOLADE	
Dambusters	$9.88
Fight Night	$9.88
Killed Until Dead	$9.88
Law of the West	$9.88
PSI-5 Trading Company	$9.88
ACTIVISION	
Cross Country Road Race	$9.88
Ghostbusters	$9.88
Hacker 1 or 2	$9.88 Ea.
Little Computer People	$9.88
Transformers	$9.88
ARTWORX	
Beach Blanket Volleyball	$9.88
Equestrian Show Jumper	$9.88
Highland Games	$9.88
Police Cadet	$9.88
Thai Boxing	$9.88
AVANTAGE	
Deceptor	$9.88
Desert Fox	$9.88
Plasmatron	$9.88
Power	$9.88
Project Space Station	$9.88
Sigma 7	$9.88
Spy vs. Spy 1 & 2	$9.88
BOX OFFICE	
Alf	$9.88
High Rollers	$9.88
$100,000 Pyramid	$9.88
BRODERBUND	
Choplifter/David's Midnight Magic	$9.88
Karateka	$9.88
Loderunner	$9.88
CDA	
America Cooks Series:	
American	$9.88
Chinese	$9.88
French	$9.88
Italian	$9.88
Mexican	$9.88
DATA EAST	
Express Raiders	$8.88
Q-Bert	$8.88
TNK III	$8.88
EASY WORKING/ SPINNAKER	
Filer	$6.88
Planner	$6.88
Writer	$6.88
ELECTRONIC ARTS	
Adv. Const. Set	$9.88
Age of Adventure	$9.88
America's Cup Sailing	$9.88
Archon	$9.88
Archon 2: Adept	$9.88
Financial Cookbook	$9.88
Heart of Africa	$9.88
Lords of Conquest	$9.88
Mail Order Monsters	$9.88
Mind Mirror	$9.88
Movie Maker	$9.88
M.U.L.E.	$9.88
Murder Party	$9.88
Music Const. Set	$9.88
One-on-One	$9.88
Pinball Const. Set	$9.88
Racing Dest. Set	$9.88
Realm of Impossibility	$9.88
Seven Cities of Gold	$9.88
Skyfox	$9.88
Super Boulder Dash	$9.88
Touchdown Football	$9.88
Ultimate Wizard	$9.88
EPYX	
Gateway to Apshai	$6.88
Pitstop 1 or 2	$6.88 Ea.
P.S. Graphics Scrapbook #1: Sports	$9.88
#2: Off the Wall	$9.88
#3: School	$9.88
Ernie's Magic Shapes	$6.88
Grover's Animal Adv.	$6.88
Pals Around Town	$6.88
INFOCOM	
Hitchhiker's Guide	$9.88
Infocomics	Call
Zork 1	$9.88
KONAMI/ACTION CITY	
Circus Charlie	$9.88
Hyper Sports/Ping Pong	$9.88
Track & Field	$9.88
MASTERTRONIC	
Action Biker	$4.88
Bounder	$6.88
Captain Zap	$6.88
Energy Warrior	$6.88
Excaliba	$4.88
Feud	$6.88
Games Creator	$6.88
Kane	$4.88
Knight Games	$6.88
Last V-8	$4.88
Ninja	$4.88

THUNDER MOUNTAIN

Top Gun™ puts you in the fighter pilots seat of a technologically advanced F-14 Tomcat.

Top Gun™
Our Discount Price $6.88

ACTIVISION

GHOSTBUSTERS
THE COMPUTER GAME IS HERE

Ghostbusters
Our Discount Price $9.88

FISHER PRICE	
Dance Fantasy	$4.88
Memory Manor	$4.88
Number Tumblers	$4.88
Sea Speller	$4.88
*all above titles on cart.	
GAMESTAR	
On Court Tennis	$9.88
Star League Baseball/ On Field Football	$9.88
HES	
Microsoft Multiplan	$9.88
HI-TECH EXPRESSIONS	
Award Ware	$9.88
Card Ware	$6.88
Party Ware	$9.88
Print Power	$9.88
The Computer Club	$9.88
HI-TECH EXPRESSIONS	
Sesame St. Print Kit	$9.88
Sesame Street Series:	
Astro-Grover	$6.88
Big Bird's Special Delivery	$6.88
Ernie's Big Splash	$6.88
Pro Golf	$4.88
Prowler: War in 2150	$6.88
Shogun	$6.88
Speed King	$6.88
Squash	$6.88
Storm	$6.88
Vegas Poker & Jackpot	$4.88
Water Polo	$6.88
Wing Commander	$4.88
SEGA	
Congo Bongo (R)	$6.88
Super Zaxxon (R)	$6.88
SSI	
Computer Baseball	$9.88
Computer Quarterback	$9.88
Fifty Mission Crush	$9.88
Gemstone Warrior	$9.88
Questron	$9.88
Wings of War	$9.88
SHARE DATA	
Concentration	$9.88
Family Feud	$8.88
Jeopardy	$8.88
Jeopardy Jr.	$9.88
Wheel of Fortune	$8.88
Wheel of Fortune 2	$9.88
SIMON & SCHUSTER	
Great Int'l. Paper Airplane Construction Set	$9.88
SPECTRUM HOLOBYTE	
Gato	$9.88
SPINNAKER	
Alf in the Color Cave	$4.88
Bubble Busters	$4.88
Cosmic Combat	$4.88
Fraction Fever	$4.88
Gold Record Race	$4.88
Letter Scrambler	$4.88
Monster Voyage	$4.88
Ranch	$4.88
Story Machine	$4.88
*all above titles on cart.	
TELARIUM	
Amazon	$9.88
Dragonworld	$9.88
Fahrenheit 451	$9.88
Nine Princes in Amber	$9.88
Perry Mason: Case of Mandarin Murder	$9.88
Rendezvous w/Rama	$9.88
THUNDER MOUNTAIN	
Army Moves	$6.88
Demolition Mission	$6.88
Dig Dug	$6.88
Doc the Destroyer	$6.88
Eliminator	$6.88
Equinox	$6.88
Great Escape	$6.88
Gun Runner	$6.88
Implosion	$9.88
Leviathan	$6.88
Mission in Our Solar System	$6.88
Ms. Pac Man	$6.88
Murder by the Dozen	$6.88
Mutants	$9.88
Pac Man	$6.88
Paradroid	$6.88
Pole Position	$6.88
Rambo: First Blood Part II	$6.88
Slot Car Racer	$6.88
Tai-Pan	$9.88
Tau-Ceti	$9.88
Top Gun	$6.88
Winter Challenge	$9.88
Wizball	$9.88
VALUE WARE	
Artist	$4.88
Educator	$4.88
Entertainer	$4.88
Home Banker	$4.88
Home Manager	$4.88
Kitchen Manager	$4.88

*All programs on disk unless otherwise noted!

AVANTAGE

Your mission: Design the space station and build it by using the shuttle. The future of NASA is in your hands.

Project Space Station
Our Discount Price $9.88

INFOCOM

The greatest challenge lies ahead-and downwards.

Zork1
Our Discount Price $9.88

P.O. BOX 111327—DEPT. CG—BLAWNOX, PA 15238

*Please Read The Following Ordering Terms & Conditions Carefully Before Placing Your Order: Orders with cashiers check or money order shipped immediately on in stock items! Personal & Company checks, allow 3 weeks clearance. No C.O.D.'s! Shipping: Continental U.S.A.-Orders under $100 add $3; free shipping on orders over $100. AK, HI, FPO, APO-add $5 on all orders. Canada & Puerto Rico-add $10 on all orders. Sorry, no other International orders accepted! PA residents add 6% sales tax on the total amount of order including shipping charges. CUSTOMER SERVICE HOURS: Mon.-Fri. 9 AM-5:30 PM Eastern Time. REASONS FOR CALLING CUSTOMER SERVICE—412-361-5291 (1)Status of order or back order (2)if any merchandise purchased within 60 days from S.D.of A. is defective, please call for a return authorization number. We will not process a return without a return auth. #! Defective merchandise will be replaced with the same merchandise only. Other returns subject to a 15% restocking charge! After 60 days from your purchase date, please refer to the warranty included with the product purchased & return directly to the manufacturer. Customer service will not accept collect calls or calls on S.D.of A.'s 800# order lines! ORDER LINE HOURS: Mon.-Fri. 9 AM-5:30 PM, SAT 10 AM-4 PM EASTERN TIME. Because this ad had to be written 2-3 mos. before it was published, prices & availability are subject to change! New titles are arriving daily! Please call for more information.

SOFTWARE DISCOUNTERS OF AMERICA

S.D. of A.

For Orders Only — 1-800-225-7638
PA Orders — 1-800-223-7784
Customer Service 412-361-5291

- Free shipping on orders over $100 in continental USA
- No Surcharge for VISA/MasterCard
- Your card is not charged until we ship

ABACUS BOOKS
Anatomy of the 1541 ..$14
Anatomy of the C64 ..$14
1571 Internals $14
GEOS Inside & Out ...$13
GEOS Tricks & Tips ...$13

ABACUS SOFTWARE
Assembler Monitor ...$25
Basic $25
Basic 128 .....$39
*Becker Basic $33
Cad Pak $25
Cad Pak 128 .....$39
Chart Pak $25
Chart Pak 128 .....$25
Cobol $25
Cobol 128 .....$25
PPM $25
PPM 128 .....$39
Speed Term 64 or 128 $25
Super C $39
Super C 128 .....$39
Super Pascal $39
Super Pascal 128 .....$39
TAS $25
TAS 128 .....$39
*Requires GEOS!

ACCESS
Echelon w/Lip Stik ...$29
Famous Course Disk #1 for World Class L.B. ..$14
Famous Course Disk #2 for World Class L.B. ..$14
Famous Course Disk #3 for World Class L.B. ..$14
Leader Board (Original) 3 Pack $14
Lip Stik Plus $17
Tenth Frame $25
Triple Pack: BH1, BH2, Raid Over Moscow .$14
World Class Leader Board $25

ACCOLADE
Ace of Aces $19
Apollo 18: Mission to the Moon $19
Card Sharks $19
4th & Inches Football .$19
Hardball $19
Mini Putt $19
Power at Sea $19
Test Drive $19
The Train: Escape to Normandy $19

ACTION SOFT
Thunder Chopper $19
Up Periscope! $19

ACTIVISION
Aliens $23
Black Jack Academy ...25
Gee Bee Air Rally $19
Maniac Mansion $23
Might & Magic $25
Music Studio $23
Postcards $16
Rampage $23
Shanghai $19
The Last Ninja $23

AMERICAN EDUCATIONAL
Biology $12
Learn to Read (Gr. 1-4) $25
Phonics (K-3) $25
Science: Grades 3/4 ...$12
Science: Grades 5/6 ...$12
Science: Grades 7/8 ...$12
US Geography $12
US History $12
World Geography $12
World History $12

ARTWORX
Bridge 5.0 .....$19
Cycle Knight $14
International Hockey ..$14
Linkword French $16
Linkword German $16
Linkword Russian $16
Linkword Spanish $16
Strip Poker $21
Data Disk #1 Female ..$14
Data Disk #2 Male ...$14
Data Disk #3 Female ..$14

AVALON HILL
Gulf Strike $19
NBA Basketball $25
NBA '85-86 Season Disk$14
Spitfire '40 .....$23
Super Sunday $21
SBS 1985 Team Disk ..$14
SBS 1986 Team Disk ..$14
SBS Gen. Mgr. Disk ...$19

BATTERIES INCLUDED
Consultant 64 & 128 ..$39
Outrageous Pages $33
Paperclip Publisher ...$33
Paperclip 3 .....$33

BAUDVILLE
Blazing Paddles $23
Rainy Day Games $19
Video Vegas $19

BERKELEY SOFTWORKS
Geos 128 .....$44
Geo-Calc 128 .....$44
Geo-File 128 .....$44
Geo-Write Workshop 128$44
Geos 64 .....$39
*Geo-Calc $33
*Geo File $33
*Geos Font Pak 2 ....$19
*Geo-Programmer $44
*Geo-Publish $44
*Geo-Spell $19
*Geo-Write Workshop .$33
*Requires Geos 64!

BETTER WORKING
Business Form Shop ..$25

BRODERBUND
Carmen Sandiego: Europe $25
Carmen Sandiego: USA $25
Carmen Sandiego: World $23
Print Shop $26
P.S. Companion $23
P.S. Graphics Library #1, #2, or #3 ...$16 Ea.
P.S. Graphics Library Holiday Edition $16
Toy Shop $19

CAPCOM
Ghosts & Goblins $19
Gunsmoke $19
Side Arms $19
Speed Rumbler $19

CBS
Success w/Algebra: Binomial Multiplication & Factoring $19
Success w/Algebra: First Degree & Advanced Linear Equations ..$19
Graphing Linear Functions $19
Simultaneous & Quadratic Equations .$19
Success w/Math: Addition & Subt $19
Success w/Math: Decimals: Add. & Subt.$19
Success w/Math: Decimals: Mult. & Div.$19
Success w/Math: Fractions: Add. & Subt.$19
Success w/Math: Fractions: Mult. & Div.$19
Success w/Math: Multiplication & Division $19

CINEMAWARE
Defender of the Crown$23
The Three Stooges $23
Warp Speed $33

CMS
General Acct. 128 ...$119
Inventory 128 .....$49

DATA EAST
Breakthru $19
Commando $14
Ikari Warriors $19
Karnov .....Call
Kid Niki $19
Lock On .....Call
Speed Buggy $19
Tag Team Wrestling ...$14
Victory Road $19

DATASOFT
Alternate Reality: The City $19
Alternate Reality: The Dungeon $26
Dark Lord $14
Global Commander ...$19
Hunt for Red October $32
Tomahawk $21
Video Title Shop w/ Graphics Companion $21

DAVIDSON
Algeblaster $32
Math Blaster $32
Speed Reader 2 .....$32
Spell It $32
Word Attack $32

DESIGNWARE
Body Transparent $19
European Nations $19
Mission Algebra $19
Spellicopter $19
States & Traits $19

DIGITAL SOLUTIONS
Pocket Filer 2 .....$33
Pocket Planner 2 .....$33
Pocket Writer 2 .....$33
*all 3 in 1 Super Pack .59

ELECTRONIC ARTS
Alien Fires $19
American Civil War ..$26
Arctic Fox $23
Bard's Tale 1 or 2 .$26 Ea.
Bard's Tale 1 or 2 Hints$9 Ea.
Chessmaster 2000 ....$26
Chuck Yaeger's AFT ...$23
Demon Stalker $21
Dragon's Lair $19
Earth Orbit Station ...$21
Halls of Montezuma ..$26
Instant Music $21
Legacy of Ancients ...$21
Marble Madness $21
Master Ninja $19
Monopoly $26
Patton vs. Rommel $21
Pegasus $21
Rockford $21
Scrabble $23
Scruples $23
Skyfox 2 .....$21
Skate or Die $21
Star Fleet 1 .....$26
Strike Fleet $21
Twilights Ransom ....Call
World Tour Golf $21

EPYX
Boulder Dash Construction Kit $14
California Games $24
Champ. Wrestling $14
Coil Cop $14
Create A Calendar $19
Destroyer $24
Fast Load (R) $24
4 x 4 Off Road Racing $24
The Games: Winter Edition $24
Omicron Conspiracy ..$24
Rad Warrior $14
Spiderbot $14
Spy vs. Spy 3: Arctic Antics $14
Street Sports: Baseball $24
Street Sports: Basketball $24
Sub Battle Simulator ..$24
Summer Games $14
Summer Games 2 ....$14
Temple Apshai Trilogy .$14
Winter Games $14
World Games $24

FIREBIRD
Elite $19
Guild of Thieves $25
Knight Orc $25
Starglider $25
The Pawn $25

GAMESTAR
Champ. Baseball $19
Champ. Basketball $23
GFL Ch. Football $23
Star Rank Boxing 2 ...$19
Top Fuel Eliminator ...$19

HAYDEN
Sargon 3 .....$14
SAT Complete $25

INFOCOM
Beyond Zork 128 .....$29
Border Zone $23
Leather Goddesses ...$23
Nord & Bert Couldn't Make Head or Tail of It ...$23
Sherlock: The Riddle of the Crown Jewels $23
Stationfall $23
The Lurking Horror ...$23
Zork Trilogy $29

INKWELL SYSTEMS
#170 Deluxe L.P. $69
#184C Light Pen $44
Flexidraw 5.5 .....$23
Graphics Intregrator 2 $19

INTRACORP
Bumper Sticker Maker $33
Business Card Maker ..$33
Button & Badge Maker $33

KONAMI/ACTION CITY
Boot Camp .....Call
Contra $19
Jackal $19
Rush 'n Attack/Yie Ar Kung Fu $19

LOGICAL DESIGN
Club Backgammon ...Call
Vegas Craps $19
Vegas Gambler $19

MICROLEAGUE
Baseball $25
Box Score Stats $16
General Manager $19
1986 Team Data Disk .$14
1987 Team Data Disk .$14
WWF Wrestling $19

MICROPROSE
Acrojet $16
Airborne Ranger $23
Conflict in Vietnam ...$25
Crusade in Europe $25
F-15 Strike Eagle $23
Gunship $23
Kennedy Approach ...$16
Pirates $25
Project Stealth Fighter $25
Red Storm Rising ....Call
Silent Service $23
Top Gunner $16

MINDSCAPE
Bad Street Brawler ...$19
Bop & Wrestle $19
Color Me: The Computer Coloring Kit $23
*Deeper Dungeons ...$16
De Ja Vu $23
Gauntlet $23
High Roller $19
Indoor Sports $19
Infiltrator 1 or 2 ..$19 Ea.
Into the Eagle's Nest ..$19
Living Daylights $19
MISL Soccer $23
Paperboy $23
Perfect Score SAT $44
Road Runner $23
Super Star Ice Hockey $23
Super Star Soccer $23
Uchi Mata Judo $19
*Requires Gauntlet!

MISC
Bob's Term Pro $29
Bob's Term Pro 128 ...$39
C.P. Copy 2 .....$21
Doodle $25
Final Cartridge 3 .....$47
Font Master 2 .....$29
Font Master 128 .....$35
Superbase 64 .....$39
Superbase 128 .....$44
Superscript 64 .....$29
Superscript 128 .....$39

ORIGIN
Autoduel $32
Moebius $25
Ogre $19
Ultima 1 or 3 ....$25 Ea.
Ultima 4 .....$39
Ultima 5 .....$39

PROFESSIONAL
Fleet Filer $19
Fleet System 2 Plus ...$39
Fleet System 4 128 ...$47

SIMON & SCHUSTER
Chem. Lab $25
JK Lasser Money Mgr. .$25
Typing Tutor 4 .....$25

SIR TECH
Deep Space $25
WIzardry: Proving Grounds $25

SOFTWARE SIMULATIONS
Football $19
Pure Stat Baseball $25
Pure Stat College Basketball $25
*Data Disks Avail.....Call

SPRINGBOARD
Certificate Maker $14
C.M. Library Vol. 1 ..$9.88
Newsroom $14
N.R. Clip Art Vol. 1 .$9.88
N.R. Clip Art Vol. 2 .$9.88
N.R. Clip Art Vol. 3 .$9.88
P.S. Graphics Expander $23

SSI
Battle of Antietam $32
B-24 .....$23
Eternal Dagger $25
Gettysburg $37
Kampfgruppe $37
Panzer Strike! $29
Phantasie 1, 2 or 3 $25 Ea.
President Elect 1988 ..$16
Questron 2 .....$25
Realms of Darkness ...$25
Rings of Zilfin $25
Roadwar 2000 .....$25
Roadway Europa $25
Shard of Spring $25
Shiloh: Grant's Trial ..$25
Sons of Liberty $23
War Game Const. Set .$19
War in S. Pacific $37
Warship $37
Wizard's Crown $25

SUBLOGIC
Flight Simulator 2 ....$32
F.S. Scenery Disks ....Call
Jet $26
Stealth Mission $32

THREE SIXTY
Dark Castle $23

TIMEWORKS
Accts. Payable $33
Accts Receivable $33
Data Manager 2 .....$14
Data Manager 128 ....$33
Evelyn Wood Reader ..$14
General Ledger $33
Partner 64 (R) $25
Partner 128 (R) $33
Swiftcalc/Sideways (D) .$19
Swiftcalc/Sideways 128 $33
Sylvia Porter's Personal Fin. Planner 64 ....$25
Sylvia Porter's Personal Fin. Planner 128....$33
Word Writer 3 .....$25
Word Writer 128 .....$33

UNICORN
Decimal Dungeon $19
Fraction Action $19
Percentage Panic $19
Race Car Rithmetic $19
Ten Little Robots $19

UNISON WORLD
Art Gallery 1 or 2 .$16 Ea.
Art Gallery: Fantasy ...$16
Print Master Plus $23

WEEKLY READER
Stickybear Series: ABC's $16
Stickybear Series: Math 1 or 2 .....$16 Ea.
Stickybear Series: Numbers $16
Stickybear Series: Opposites $16
Stickybear Series: Reading $16
Stickybear Series: Spellgrabber $16
Stickybear Series: Typing $16

ACCESSORIES
Animation Station $49
Bonus SS, DD ..$4.99 Bx.
Bonus DS, DD ..$5.99 Bx.
Compuserve Starter Kit $19
Contriver Mouse $39
Disk (Case (Holds 75)$6.88
Disk Drive Cleaner ..$6.88
Epyx 500 XJ Joystick ..$14
Icontroller $14
Suncom TAC 5 J.S. $14
Wico Bat Handle $17
Wico Boss $12
XETEC Super Graphix .$59
Xetec Super Graphix Gold $89
XETEC Super Graphix Jr.$39

*All programs on disk unless otherwise noted!

P.O. BOX 111327—DEPT. CG—BLAWNOX, PA 15238

*Please Read The Following Ordering Terms & Conditions Carefully Before Placing Your Order: Orders with cashiers check or money order shipped immediately on in stock items. Personal & Company checks, allow 3 weeks clearance. No C.O.D.'s! Shipping: Continental U.S.A.—Orders under $100 add $3; free shipping on orders over $100. AK, HI, FPO, APO—add $5 on all orders. Canada & Puerto Rico—add $10 on all orders. Sorry, no other International orders accepted! PA residents add 6% sales tax on the total amount of order including shipping charges! CUSTOMER SERVICE HOURS: Mon.-Fri. 9 AM-5:30 PM Eastern time. REASONS FOR CALLING CUSTOMER SERVICE—412-361-5291 (1) Status of order or back order (2) if any merchandise purchased within 60 days from S.D. of A. is defective, please call for a return authorization number. We will not process a return without a return auth. #! Defective merchandise will be replaced with the same merchandise only. Other returns subject to a 15% restocking charge! After 60 days from your purchase date, please refer to the warranty included with the product purchased & return directly to the manufacturer. Customer service will not accept collect calls or calls on S.D. Of A.'s 800# order lines! ORDER LINE HOURS: Mon.-Fri. 9 AM-5:30 PM, Sat. 10 AM-4 PM EASTERN TIME. Because this ad had to be written 2-3 mos. before it was published, prices & availability are subject to change! New titles are arriving daily! Please call for more information!

commodore **WE'VE GOT IT ALL!!**

THE FOLLOWING LIST IS JUST A SAMPLE OF THE OVER 2000 SOFTWARE TITLES THAT WE SELL FOR COMMODORE.

MANY OF THE SAME TITLES ARE AVAILABLE IN AMIGA AND IBM FORMATS WITH SIMILAR SAVINGS.

IF YOU DON'T SEE IT . . . CALL!!

MOST AMIGA, IBM and COMMODORE SOFTWARE 40% OFF LIST PRICE!!

commodore PET

8032 Computer **74.95**

4032 Computer **49.95**

SFD1001 $CALL

8032 160 CPS Computer **99.95**

*Alien Fires $19.95
*Battle Droidz 16.95
*Global Commander 19.95
*Hunt for Red October 25.95
*Master Ninja 19.95
*Monopoly 19.95
*Paper Clip Publisher 31.95
*Patton vs. Rommel 19.95
*Roadwars 19.95
*Rockford 19.95
*Rubicon Alliance 13.95
*Tobruk 19.95
Video Title Shop 19.95
Skate or Die 19.95
*Never Ending Story 13.95
*Gunslinger 19.95
Dark Lord 13.95
League of the Ancients 19.95
*Sky Fox II 19.95
Instant Music 19.95
Bard's Tale 25.95
Bard's Tale II 25.95
Chessmaster 2000 25.95
World Tour Golf 19.95
Marble Madness 19.95
Pegasus 19.95
Murder Party 10.95
Scrabble 22.95
America's Cup 10.95
Artic Fox 21.95
All Classics 10.95
Amnesia 25.95
Bismark 19.95
Chuck Yeager 22.95
Paper Clip III 31.95
Outrageous Pages 31.95
Clue Books $CALL
Dan Dare 13.95
Earth Orbit Station 19.95
Starfleet 1 25.95
Strike fleet 19.95
Sport of War $CALL
Twilights Ransom $CALL

PROGRESSIVE PERIPHERALS

Superbase 128 $59.95
Superbase 64 49.95
Superscript 128 49.95
Visastar 64 49.95
Visawrite 128 44.95
Micralawyer 44.95

MINDSCAPE

Gauntlet 20.95
Paperboy 20.95
*Indiana Jones $CALL
Perfect Score S.A.T. 41.95
Infiltrator II 20.95
*Deja Vu 23.95
*MISL Soccer 20.95
Super Star Hockey 20.95
High Roller 17.95
Indoor Sports 17.95
Infiltrator 17.95
Super Star Soccer 20.95
*Roadrunner $CALL
*Gauntlet II 20.95
*Deeper Dungeons 14.95
*Sinbad 20.95
*Blockbuster 17.95
*Bad Street Brawler 17.95

ACCOLADE

Lipstick Plus 19.95
*Card Sharks 17.95
*Plasmatron $CALL
*Power at Sea 17.95
Project Space Station $CALL
*The Train 17.95
Hard Ball 16.95
Apollo 18 17.95
Test Drive 17.95
Ace of Aces 17.95
Comics 17.95
Mini-Putt 17.95
Fourth and Inches 17.95
*Bubble Ghost $CALL

Jeopardy
Wheel of Fortune
Family Feud
$8.95 each

CINEMAWARE

Warp Speed $29.95
SDI 20.95
Defender of the Crown 20.95
King of Chicago 20.95
*3 Stooges 20.95
*Rocket Ranger 20.95

Abacus

*BeckerBasic 29.95
GEOS Tricks and Tips 8.95
Abacus Books $SAVE
GEOS In and Out (Disk) 8.95
Basic 128 35.95
Cadpak 128 35.95
Chartpak 128 23.95
Cobol 128 35.95
PPM 128 35.95
Super C 128 35.95
TAS 128 35.95
Super Pascal 128 35.95
Basic 64 23.95
Cadpak 64 23.95
Chartpak 64 23.95
Cobol 64 23.95
TAS 64 23.95
Super C Compiler 64/128 35.95
Super Pascal 35.95
Assembler Monitor 23.95
PPM 23.95

Firebird

Knight Ork $23.95
Pawn 23.95
Guild of Thieves 23.95
Starglider 23.95
Elite 23.95
Sentry 23.95
Tracker 23.95

ACCESS

Stealth Fighter $23.95
MACH-128 29.95
Echelon 26.95
World Class Leaderboard 23.95
10th Frame 23.95
Exec Tournament 11.95
Triple Pak 11.95
Famous Courses 1 11.95
Famous Courses 2 11.95

ACTIVISION

I Am the 64 $17.95
I Am the 128 17.95
*Might and Magic 23.95
Portal 23.95
Labrynth 20.95
Aliens 20.95
Last Ninja 20.95
Top Fuel Elim 17.95
Game Maker 23.95
Music Studio 17.95
Maniac Mansion 20.95
Air Ralley 17.95
Rampage 20.95
Black Jack Academy 23.95

SPRINGBOARD

Certificate Maker $29.95
Newsroom 29.95
Clip Art 1 17.95
Clip Art 2 23.95

PROFESSIONAL SOFTWARE

Fleet System 4 $47.95
Fleet System 2 35.95
Fleet Filer 23.95

UNISON WORLD

Art Gallery $15.95
Art Gallery 2 15.95
Print Master 20.95

Broderbund Software

*Carmen/Europe $CALL
*Ultima 5 $CALL
Super Bike Challenge $CALL
*Magnetron 14.95
Printshop 24.95
Graphics Lib. 14.95
Carmen SanDiego (World) 20.95
Print shop comp. 20.95
Carmen/USA 23.95
Arcade Construction Kit 17.95

subLOGIC

Flight Sim II $31.95
Scenery Disk 16.95
Jet 29.95
Stealth Mission 31.95

TIMEWORKS

*Swift Tax $29.95
Word Writer 128 $CALL
Data Mgr. 128 35.95
Swiftcalc 128 35.95
Partner 128 41.95
Sylvia Porter 128 $CALL
Partner 64 35.95
Sylvia Porter 64 41.95
Desktop Publisher $CALL
Wordwriter 3 29.95

MicroProse

Gunship $20.95
F-15 20.95
Project Stealth Fighter 23.95
Airborne Ranger 23.95
Silent Service 23.95
Pirates 23.95
Top Gunner 17.95
*Red Storm Rising 23.95

Xetec, Inc.

Font Master II 64 $29.95
Font Master 128 W/Spell 41.95

Berkeley Softworks

Geowrite 128 $41.95
Geocalc 128 41.95
Geofile 128 41.95
*DeskPack 128 41.95
GEOS 128 41.95
GEOS 35.95
Fontpak 1 17.95
Desk Pack 20.95
Writer Work Shop 29.95
Geodex 23.95
GeoCalc/GeoFile each 29.95
Geopublish 41.95
Geoprogrammer 29.95
GEOspell 17.95
Triple Pack 29.95

EPYX

Destroyer $23.95
*Four and Four Racing $CALL
*Home Video Producer $CALL
Impossible Mission II $CALL
Summer Games II $CALL
Fast Load 23.95
Street Sports
-Baseball/Basketball each 23.95
World Karate Champ 11.95
Super Cycle 11.95
World Games 23.95
Winter Games 11.95
Sub Battle 23.95
California Games 23.95
500 Joystick 14.95
Home Video Producer 29.95
Championship Wrestling 23.95
Create a Calendar 17.95
Street Sports Basketball 23.95
*Street Sports Soccer 23.95
Street Sports Baseball 23.95
Summer Games $Call
World's Greatest Baseball 11.95
World's Greatest Football 11.95
*Games-Winter Edition 23.95

SSI

Wargame Construction Set $17.95
Roadwar Europa 23.95
Phantasie 1,2,3 each 23.95
Gemstone Healer 17.95
Gettysburg 35.95
Kampfgruppe 35.95
Ring of Zelfin 23.95
Road War 2000 23.95
Shard of Spring 23.95
Wizard's Crown 23.95
Panzer Strike 23.95
*Questron II 23.95
Sons of Liberty 20.95
Eternal Dagger 23.95
Realms of Darkness 23.95
Wrath of Nicademus $CALL

Pocket Writer 2/Filer/Planner $34.95
Super Pack 2 (128) 59.95
Dictionary Disk 9.95

KRACKER JAX

C-128 Canon $27.95
Shotgun II 11.95
Bull's eye 15.95
Geos Busters 4.95
Kracker Jax 5/6/7 15.95

Micro L. Baseball $23.95
General Mgr 23.95
Stat Disk 14.95
86' Team Disk 11.95
Micro League Wrestling 23.95

SPINNAKER

Easy Working Filer $7.95
Easy Working Writer 7.95
Easy Working Planner 7.95
Better Working Word Publisher 23.95
Turbo Load & Save 14.95
S.A.T. Complete 23.95
Business Form Shop 23.95
Homework Helper Writing 20.95
Homework Helper Word Problems 20.95

SHAREDATA

Wheel of Fortune II $8.95
Jeopardy Jr. 8.95

SOFTWARE SIMULATION

Football $17.95
Pure Stat Baseball 23.95
Pure Stat College BB 23.95
Stat Mgr. 11.95
Stadium Disk 11.95

AVALON HILL

Wooden Ships and Iron Men $20.95
Super Bowl Sunday 20.95
SBS 1985 Team Disks 11.95
SBS 1986 Team Disks 11.95
SBS Gen Mgr. Disk 11.95

DAVIDSON

Algeblaster $29.95
Mathblaster 29.95
Spell It 29.95
Word Attack 29.95

MICROILLUSIONS

Land of Legends $23.95
Galactic Invasion 14.95
Planetarium 41.95
Faery Tale 29.95
Black Jack 23.95

ART WORX

NBA $29.95
Bridge 5.0 20.95
French 11.95
Spanish 11.95
German 11.95
Italian 11.95
Strip Poker 17.95
Data Disk 11.95

DATA EAST

Commando $20.95
Speed Buggy 17.95
Karate Champ 23.95
Tag Team Wrestling 20.95
Kid Niki $CALL

ACTIONSAFE

Up Periscope $19.95
Thunderchopper 19.95

GAMESTAR

Championship Baseball $23.95
Championship Football 23.95
GBA Basketball 2 on 2 23.95
Top Fuel Eliminator 17.95
Star Rank Boxing II 17.95

ORIGIN

Auto Duel $23.95
Moebius 23.95
Ogre 23.95
Ultima III 35.95
Ultima IV 35.95
Ultima V $CALL

INFOCOM

Beyond Zork $26.95
Hitchhiker's Guide 17.95
Info Comics $CALL
Hollywood Hijinx 23.95
Leather Goddesses 23.95
Lurking Horror 23.95
Nor & Bert 23.95
Moonmist 23.95
Zork Trilogy 41.95
Plundered Hearts 23.95
all Infoclues 6.95
Bureaucracy 20.95

MISC.

NBA $29.95
Mousetrap 11.95
Pacman 6.95
Ms. Pacman 6.95
Skaritem 20.95
Wizardry 23.95
Dark Castle 20.95
Strip Poker 17.95
Dome Bookeeping 23.95
Warp Speed $CALL
Dig Dug 7.95
Sticky Bear (All) 17.95
Typing Tutor IV 29.95
Ghosts and Goblin 17.95
1942 17.95
Super Snapshop II $CALL
Top Gun 6.95
Flexidraw Light Pen 49.95
Flexidraw 5.5 Software 20.95
*Racing Simulation Games 9.95
*Drag Race Eliminator 14.95
*Final Cartridge III 44.95

☑ Check THEIR Ad then ☑ CHECK OUR PRICE!

- 256K Ram (1000) . $100
- Insider Unpopulated 11 Meg . . . $180

3.5 Disk Drive With Pass Thru . . From $160

Seagate 20 MEG $229.95
Seagate 30 MEG $259.95
w/controller

- PRO GEN
- FRAME GRABBER
Special Introductory Price!

commodore PC10-2 TURBO

$599.95*

*with any monitor purchase

SYSTEM INCLUDES:

- 640K
- Dual Drive
- Serial Port
- Parallel Port
- Graphics Card
- 2-Speed C.P.U.

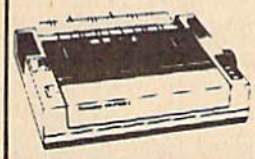
- 512K Ram (500) . . . $130
- 1 Meg (Unpopulated) . . $CALL
- 2 Meg . . . . . $CALL

Magnavox 515 . . . . . $275
1084 . . . . . $275
EGA Multiscan Mon. . $CALL

OKIMATE 20 $180

- MAURADER II . . $24
- COPY II PC . . $CALL

Panasonic Industrial Company



Laser	$Call
1080i-II	$180*
1091I-II	$200*
1092i	$280*
1592i	$380*
1524i	$520*

*W/2 Ribbon Purchase

star micronics

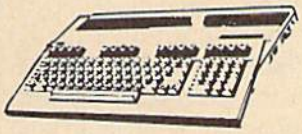
NX1000 Rainbow $220

Laser	$Call
NX1000	$160*
NX15	280*
NB2410	380*
NR15	420*
Powertpe LQ	160*
NX1000C	$180*

*W/2 Ribbon Purchase

HARDWARE

- 1764 RAM $119.95
- 1351 Mouse $34.95
- AB Switch $30
- Aprotek Minimodem . . . $49.95
- 1670 Modem $79.95
- 64 Power Supply . . . $29.95
- Digiview 2.0 . . . . . $129.95
- Digiview Camera . . . $199.95 w/16mm Lens (RCA)
- Digiview Stand $55
- Disk Case(3½) $8
- Disk Head Clnr $8
- Xetec Junior $34.95
- Epyx Joystick $15
- Most Cables $15
- Mouse Pad $6
- Super Snapshot II . . . $49.95
- Hard Cards . . . . . $Call
- Printer Drivers . . . . . $Call
- Disk Notcher $4.95
- Cartridge Expander . . . $22.95
- Sonix Speakers $70



64C with GEOS $129.95*
128 . . . . . $189.95*
128D $429.95
*PACKAGE PRICING

FSD-2 . . . . . $149.95

1541-II $169.95
1581 . . . . . $179.95
1571 . . . . . $219.95
Excel 2001 . . . . $199.95

1802c $189.95
1084 . . . . . $274.95
Magnavox 8762 . . . $250.95

MODEMS

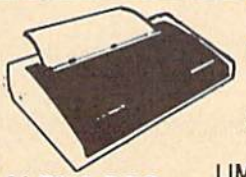
SUPRA
Hayes Compatible External
2400 . . . . $169.95*

KISS ENGINEERING
2400 . . . . $129.95*
INTERNAL

Avatex

1200 E	$79.95*
1200 Int	$79.95
1200 H.C.	$99.95*
2400 Baud	$179.95*

*W Cable Purchase



18 C.P.S. Daisy Wheel

$98.00 LIMITED QUANTITY

ALPHA PRO
Commodore or IBM Interface . . . $19.95

DISKS

3½ DS/DD GENERIC $1.30
3½ DS/DD . . FROM $1.50
SONY-FUJI-MAXELL-BASF

5¼ DS/DD GENERIC (100 Lot) . . . 30¢
5¼ DS/DD (50 Lot) . . . 60¢
BASF ● NASHUA

ORDERS ONLY 800-433-7756
IN MICH. 313-427-7713 M-F
FAX: 313-427-7766 10-6
CUSTOMER SERVICE 313-427-0267
Monday thru Friday – 10:00 A.M. to 10 P.M.
Saturday — 10:00 A.M. to 6:00 P.M. (E.S.T.)

SCHOOL P.O.'s ACCEPTED
We Check For Charge Card Fraud

M.C.S.
MICROCOMPUTER SERVICES

CALL FOR TERMS — DEALER INQUIREES INVITED

No Surcharge for MC/VISA/DISCOVER — Sorry no walk in traffic
All returns must have RA# Merchandise found defective will be repaired or replaced. We do not offer refunds for defective products or for products that do not perform satisfactorily. We make no guarantees for product performance. Any money back guarantee must be handled directly with the manufacturer. Call for shipping & handling info. Prices subject to change without notice.
12864 FARMINGTON ROAD LIVONIA, MI 48150 — We cannot guarantee compatibility

How To Type In *COMPUTE!'s Gazette* Programs

Each month, COMPUTE!'s Gazette publishes programs for the Commodore 128, 64, Plus/4, and 16. Each program is clearly marked by title and version. Be sure to type in the correct version for your machine. All 64 programs run on the 128 in 64 mode. Be sure to read the instructions in the corresponding article. This can save time and eliminate any questions which might arise after you begin typing.

We frequently publish two programs designed to make typing easier: The Automatic Proofreader, and MLX, designed for entering machine language programs.

When entering a BASIC program, be especially careful with DATA statements as they are extremely sensitive to errors. A mistyped number in a DATA statement can cause your machine to "lock up" (you'll have no control over the computer). If this happens, the only recourse is to turn your computer off then on, erasing what was in memory. So be sure to *save a program before you run it.* If your computer crashes, you can always reload the program and look for the error.

Special Characters

Most of the programs listed in each issue contain special control characters. To facilitate typing in any programs from the GAZETTE, use the following listing conventions.

The most common type of control characters in our listings appear as words within braces: {DOWN} means to press the cursor down key; {5 SPACES} means to press the space bar five times.

To indicate that a key should be *shifted* (hold down the SHIFT key while pressing another key), the character is underlined. For example, A means hold down the SHIFT key and press A. You may see strange characters on your screen, but that's to be expected. If you find a number followed by an underlined key enclosed in braces (for example, {8 A}), type the key as many times as indicated (in our example, enter eight SHIFTed A's).

If a key is enclosed in special brackets, [ ], hold down the Commodore key (at the lower left corner of the keyboard) and press the indicated character.

Rarely, you'll see a single letter of the alphabet enclosed in braces. This can be entered on the Commodore 64 by pressing the CTRL key while typing the letter in braces. For example, {A} means to press CTRL-A.

The Quote Mode

Although you can move the cursor around the screen with the CRSR keys, often a programmer will want to move the cursor under program control. This is seen in examples such as {LEFT}, and {HOME} in the program listings. The only way the computer can tell the difference between direct and programmed cursor control is *the quote mode.*

Once you press the quote key, you're in quote mode. This mode can be confusing if you mistype a character and cursor left to change it. You'll see a reverse video character (a graphics symbol for cursor left). In this case, you can use the DELete key to back up and edit the line. Type another quote and you're out of quote mode. If things really get confusing, you can exit quote mode simply by pressing RETURN. Then just cursor up to the mistyped line and fix it.

When You Read:	Press:	See:
{CLR}	SHIFT + CLR/HOME	
{HOME}	CLR/HOME	
{UP}	SHIFT + ↑ CRSR ↓	
{DOWN}	↑ CRSR ↓	
{LEFT}	SHIFT + ←CRSR→	
{RIGHT}	←CRSR→	
{RVS}	CTRL + 9	
{OFF}	CTRL + 0	
{BLK}	CTRL + 1	
{WHT}	CTRL + 2	
{RED}	CTRL + 3	
{CYN}	CTRL + 4	

When You Read:	Press:	See:
{PUR}	CTRL + 5	
{GRN}	CTRL + 6	
{BLU}	CTRL + 7	
{YEL}	CTRL + 8	
{ F1 }	f1	
{ F2 }	SHIFT + f1	
{ F3 }	f3	
{ F4 }	SHIFT + f3	
{ F5 }	f5	
{ F6 }	SHIFT + f5	
{ F7 }	f7	
{ F8 }	SHIFT + f7	

When You Read:	Press:	See:
←	←	
↑	SHIFT + ↑	

For Commodore 64 Only

[1]	COMMODORE + 1	
[2]	COMMODORE + 2	
[3]	COMMODORE + 3	
[4]	COMMODORE + 4	
[5]	COMMODORE + 5	
[6]	COMMODORE + 6	
[7]	COMMODORE + 7	
[8]	COMMODORE + 8	

MONTGOMERY GRANT

GAZZETTE 6/88

IN NEW YORK & OUTSIDE CONTINENTAL USA CALL
(212) 732-4500
FOR CUSTOMER SERVICE CALL MON-FRI/9 AM-4 PM
(718)965-8686

WAREHOUSE ADDRESS: 33 34th St., Brklyn NY 11232
FOR ORDERS CALL TOLL FREE
1-800-345-7058
1-800-345-7059
OPEN 7 DAYS A WEEK FOR ORDERS: MONDAY-FRIDAY:9AM-7PM / SATURDAY & SUNDAY: 9:30AM-6PM EDT

FOR MAIL ORDERS & INQUIRES PLEASE WRITE TO:
MONTGOMERY GRANT
MAIL ORDER DEPT.
P.O. BOX 58
BROOKLYN, N.Y., 11230
FAX NO. 2125641497
TELEX NO. 422132HMOLLER

commodore apple LEADING EDGE

NO SURCHARGE FOR CREDIT CARD ORDERS

WE INVITE CORPORATE & EDUCATIONAL CUSTOMERS

C64C With Geos Program!
$149.95

C128 **$219.95**

NEW C-128D with Built in Disk Drive **$429**

#1700 128K EXPANSION MODULE	$99.95
#1764 EXPANSION MODULE	$119.95
XETEC JR. INTERFACE	$32.95
XETEC SR. INTERFACE	$52.95
C-128 POWER SUPPLY	$39.95
C64/C64-C POWER SUPPLY	$29.95
VOLKS 6480 1200 BAUD MODEM FOR C64C & 128	$84.95
XETEC LI. KERNEL 20 MB HARD DRIVES FOR: C64-C	$769
C-128	$849

commodore DISK DRIVES

C 1541/C	$149.95
C 1571	$209.95
C 1581	$189.95
C 1541II	$164.95

MONITORS

1802 COLOR MONITOR **$169.95**
C 1084 COLOR RGB MONITOR **$284.95**
THOMSON RGB COLOR MONITOR **$299.95**

COMMODORE PRINTERS

C MPS-1000	$169
C MPS-1250	$239
DPS-1101 DAISY WHEEL PRINTER	$159

C Commodore AMIGA 500

IN STOCK-CALL FOR LOW PRICE!
AMIGA 500 W/1084.....$779
AMIGA 500/1084/1010.....$979
AMIGA 2000 IN STOCK
ALL PERIPHERALS IN STOCK
A-501 512K EXPANSION · A-1010 3.5" FLOPPY DRIVE · A-1020T 5.25" DISK DRIVE WITH TRANSFORMER · A-2088D BRIDGE CARD · A-1084 RGB COLOR MONITOR · A-1680 MODEM · A-1060 SIDECAR · A-2090 HARD DRIVE CONTROLLER FOR A-2000 · A-2010 3.5" INTERNAL DISK DRIVE FOR A-2000 · A-2052 2MB EXPANSION FOR A-2000

C128

COMPUTER PACKAGES

#1 COMPLETE PACKAGE
COMMODORE 128 COMPUTER
COMMODORE 1541 DISK DRIVE
12" MONITOR
COMPUTER PRINTER
$429 COLOR MONITOR ADD $90
TO SUBSTITUTE 1571 FOR 1541 – ADD $60

#2 DELUXE PACKAGE
COMMODORE 128 COMPUTER
COMMODORE 1571 DISK DRIVE
COMMODORE 1902 COLOR MONITOR
COMMODORE 1515 80 COL. PRINTER
$659

SPECIAL!
C-128/D DELUXE PACKAGE
C-128 COMPUTER W/ BUILT-IN DISK · 1902 RGB COLOR MONITOR · COMMODORE COLOR PRINTER
$639

C64C

COMPUTER PACKAGES

#3 COMPLETE PACKAGE
COMMODORE C-64/C COMPUTER
COMMODORE 1541 DISK DRIVE
COMPUTER PRINTER
12" MONITOR
GEOS SOFTWARE PROGRAM
$349
COLOR MONITOR ADD $90

#4 COLOR PACKAGE
COMMODORE C-64C COMPUTER
COMMODORE 1541/C DISK DRIVE
COMPUTER PRINTER
COLOR MONITOR
GEOS SOFTWARE PROGRAM
$478

PACKAGES

Apple IIC or IIE Computer
5.25" Drive · 12" Monitor All Hook-up Cables & Adaptors
Package of 10 Diskettes

APPLE IIC	APPLE IIE
$579	**$799**

MAC SE	$1949
MAC SE W/20MB APPLE HARD DRIVE	$2599
IMAGEWRITER II Printer	$459
APPLE MAC + PACK	$1579
APPLE IIGS w/APPLE RGB COLOR MONITOR & 3.5" DISK DRIVE	$1379

LEADING EDGE

MODEL D PACKAGE
IBM PC/XT COMPATIBLE

512K RAM Computer Keyboard 360K Floppy Drive 4.7-7.16 MHz. 12" Monitor 8088-2 Processor
$729
SAME PACKAGE W/20 MB HAND DRIVE **$989**

PRINTERS

EPSON

FX-86E	$309.95
FX-286E	$449.95
LQ-800	$399.95
LQ-850	$489.95
LQ-500	$329.95
LQ-1050	$659.95
EX-1000	$459.95

Panasonic

1080i-II	$159.95
1092	$289.95
1091i/II	$189.95

star

NX-1000	$169.95
NX-15	$289.95
NB-2410	$399.95
NB-2415	$539.95

OKIDATA

OKIDATA-120	$199.95
OKIDATA-180	$219.95
OKIMATE-20 WITH PLUG 'N PRINT	$189.95

SANYO PR-3000 DAISY WHEEL LQ PRINTER..... $99.50

BLUE CHIP

IBM PC/XT COMPATIBLE PKG.
512K RAM Expandable to 640K 360K Floppy Disk Drive 12" Monitor
$499
SAME PKG. W/20MB HARD DRIVE **$729**

SEAGATE

20 MB HARD DRIVE W/ CONTROLLER **$269**
40 MB HARD DRIVE & 30 MB HARD DRIVE NOW IN STOCK!

SPECIAL!

commodore PC10-1

PROFESSIONAL PACKAGE
PC10-1 Computer 512K Expandable to 640K 360K Disk Drive Enhanced Keyboard Serial & Parallel Ports 12" Monitor All Hook-up Cables & Adaptors
Package of 10 Diskettes
$499
SAME PACKAGE W/20 MB HARD DRIVE **$729**

NO SURCHARGE FOR CREDIT CARD ORDERS

Certified check, Bank check, Mastercard, Visa, Am-Ex, Diner's Club, Carte-Blanche, Discover Card and C.O.D.s accepted. No additional surcharge for credit card orders. Non-certified checks must wait 4-6 weeks clearance. Money orders are non-certified checks. N.Y. residents add applicable sales tax. Prices and availability subject to change without notice. Not responsible for typographic errors. Return of defective merchandise must have prior return authorization number, or returns will not be accepted. IBM PC/XT are registered trademarks of International Business Machine Corp. All orders can be shipped Air Express—call for details

The Automatic Proofreader

Philip I. Nelson

"The Automatic Proofreader" helps you type in program listings for the 128, 64, Plus/4, and 16 and prevents nearly every kind of typing mistake.

Type in the Proofreader *exactly* as listed. Since the program can't check itself, type carefully to avoid mistakes. Don't omit any lines, even if they contain unfamiliar commands. After finishing, save a copy or two on disk or tape before running it. This is important because the Proofreader erases the BASIC portion of itself when you run it, leaving only the machine language portion in memory.

Next, type RUN and press RETURN. After announcing which computer it's running on, the Proofreader displays the message "Proofreader Active". Now you're ready to type in a BASIC program.

Every time you finish typing a line and press RETURN, the Proofreader displays a two-letter checksum in the upper-left corner of the screen. Compare this result with the two-letter checksum printed to the left of the line in the program listing. If the letters match, it's almost certain the line was typed correctly. If the letters don't match, check for your mistake and correct the line.

The Proofreader ignores spaces not enclosed in quotes, so you can omit or add spaces between keywords and still see a matching checksum. However, since spaces inside quotes are almost always significant, the Proofreader pays attention to them. For example, **10 PRINT"THIS IS BASIC"** will generate a different checksum than **10 PRINT"THIS ISBA SIC"**.

A common typing error is transposition—typing two successive characters in the wrong order, like PIRNT instead of PRINT or 64378 instead of 64738. The Proofreader is sensitive to the *position* of each character within the line and thus catches transposition errors.

The Proofreader does *not* accept keyword abbreviations (for example, ? instead of PRINT). If you prefer to use abbreviations, you can still check the line by LISTing it after typing it in, moving the cursor back to the line, and pressing RETURN. LISTing the line substitutes the full keyword for the abbreviation and allows the Proofreader to work properly. The same technique works for rechecking programs you've already typed in.

If you're using the Proofreader on the Commodore 128, Plus/4, or 16, *do not perform any GRAPHIC commands while the Proofreader is active.* When you perform a command like GRAPHIC 1, the computer moves everything at the start of BASIC program space—including the Proofreader—to another memory area, causing the Proofreader to crash. The same thing happens if you *run* any program with a GRAPHIC command while the Proofreader is in memory.

Though the Proofreader doesn't interfere with other BASIC operations, it's a good idea to disable it before running another program. However, the Proofreader is purposely difficult to dislodge: It's not affected by tape or disk operations, or by pressing RUN/STOP– RESTORE. The simplest way to disable it is to turn the computer off then on. A gentler method is to SYS to the computer's built-in reset routine (SYS 65341 for the 128, 64738 for the 64, and 65526 for the Plus/4 and 16). These reset routines erase any program in memory, so be sure to save the program you're typing in before entering the SYS command.

If you own a Commodore 64, you may already have wondered whether the Proofreader works with other programming utilities like "MetaBASIC." The answer is generally yes, *if you're using a 64 and activate the Proofreader after installing the other utility.* For example, first load and activate MetaBASIC, then load and run the Proofreader.

When using the Proofreader with another utility, you should disable *both* programs before running a BASIC program. While the Proofreader seems unaffected by most utilities, there's no way to promise that it will work with any and every combination of utilities you might want to use. The more utilities activated, the more fragile the system becomes.

The New Automatic Proofreader

```
10 VEC=PEEK(772)+256*PEEK(773)
   :LO=43:HI=44
20 PRINT "AUTOMATIC PROOFREADE
   R FOR ";:IF VEC=42364 THEN
   {SPACE}PRINT "C-64"
30 IF VEC=50556 THEN PRINT "VI
   C-20"
40 IF VEC=35158 THEN GRAPHIC C
   LR:PRINT "PLUS/4 & 16"
50 IF VEC=17165 THEN LO=45:HI=
   46:GRAPHIC CLR:PRINT"128"
60 SA=(PEEK(LO)+256*PEEK(HI))+
   6:ADR=SA
70 FOR J=0 TO 166:READ BYT:POK
   E ADR,BYT:ADR=ADR+1:CHK=CHK
   +BYT:NEXT
80 IF CHK<>20570 THEN PRINT "*
   ERROR* CHECK TYPING IN DATA
    STATEMENTS":END
90 FOR J=1 TO 5:READ RF,LF,HF:
   RS=SA+RF:HB=INT(RS/256):LB=
   RS-(256*HB)
100 CHK=CHK+RF+LF+HF:POKE SA+L
   F,LB:POKE SA+HF,HB:NEXT
110 IF CHK<>22054 THEN PRINT "
   *ERROR* RELOAD PROGRAM AND
   {SPACE}CHECK FINAL LINE":EN
   D
120 POKE SA+149,PEEK(772):POKE
    SA+150,PEEK(773)
130 IF VEC=17165 THEN POKE SA+
   14,22:POKE SA+18,23:POKESA+
   29,224:POKESA+139,224
140 PRINT CHR$(147);CHR$(17);"
   PROOFREADER ACTIVE":SYS SA
150 POKE HI,PEEK(HI)+1:POKE (P
   EEK(LO)+256*PEEK(HI))-1,0:N
   EW
160 DATA 120,169,73,141,4,3,16
   9,3,141,5,3
170 DATA 88,96,165,20,133,167,
   165,21,133,168,169
180 DATA 0,141,0,255,162,31,18
   1,199,157,227,3
190 DATA 202,16,248,169,19,32,
   210,255,169,18,32
200 DATA 210,255,160,0,132,180
   ,132,176,136,230,180
210 DATA 200,185,0,2,240,46,20
   1,34,208,8,72
220 DATA 165,176,73,255,133,17
   6,104,72,201,32,208
230 DATA 7,165,176,208,3,104,2
   08,226,104,166,180
240 DATA 24,165,167,121,0,2,13
   3,167,165,168,105
250 DATA 0,133,168,202,208,239
   ,240,202,165,167,69
260 DATA 168,72,41,15,168,185,
   211,3,32,210,255
270 DATA 104,74,74,74,74,168,1
   85,211,3,32,210
280 DATA 255,162,31,189,227,3,
   149,199,202,16,248
290 DATA 169,146,32,210,255,76
   ,86,137,65,66,67
300 DATA 68,69,70,71,72,74,75,
   77,80,81,82,83,88
310 DATA 13,2,7,167,31,32,151,
   116,117,151,128,129,167,136
   ,137
```

Free Spirit Software Inc.

UTILITIES

THE SUPER CHIPS
Custom Operating System for the C128

Three 16K ROM chips that add several powerful features to Basic 7.0 including FIND, CHANGE...THIS...TO...THAT, TYPE, UNNEW, COMBINE, MERGE, START, FILE, EDITOR and more! Simultaneous split screen directories of devices 8 & 9. Compatible with 1541/1571/1581 and virtually all software and peripherals. Only **$49.95!**

Super Chips, Custom Operating System for the C128D - Two 32K ROM chips - Only **$49.95!**

Super Chip, Custom Operating System for the C64 - One 16K ROM chip - Only **$29.95!**

Super Chip, Custom Operating System for the 64 mode of the C128 - Only **$29.95!**

SUPER AIDE

All-purpose utility program for the C64 provides:

- Bi-directional scrolling
- Auto Line Deletion
- Trace function
- Disassembler
- Lo-Res Screen Dump
- Number conversion (10, hex, binary)
- Append files
- Format — short new/complete new
- Menu-driven
- Auto Line Numbering
- Renumber
- ML Monitor
- List all variables to screen
- Hi-Res Screen Dump
- Restore newed Basic program
- Change Device number
- Packed Line Editor
- Determine file load address
- Change THIS TO THAT — search for all instances of specified string and replace with second specified string
- *And much, much more!*

Super Aide, the complete programmer's tool kit. Only **$29.95!**

"... excellent, efficient program that can help you save both money and downtime."

1541/1571 DRIVE ALIGNMENT — *Compute!'s Gazette Dec., 1987*

1541/1571 Drive Alignment reports the alignment condition of the disk drive as you perform adjustments. On screen help is available while the program is running. Includes features for speed adjustment. Complete instruction manual on aligning both 1541 and 1571 drives. Even includes instructions on how to load alignment program when nothing else will load! Works on the C64, SX64, C128 in either 64 or 128 mode, 1541, 1571 in either 1541 or 1571 mode! Autoboots to all modes. Second drive fully supported. Program disk, calibration disk and instruction manual only **$34.95!**

SUPER 81 UTILITIES

Super 81 Utilities is a complete utilities package for the 1581 disk drive and C128 computer. Among the many Super 81 Utilities features are:

- Copy whole disks from 1541 or 1571 format to 1581 partitions.
- Copy 1541 or 1571 files to 1581 disks
- Backup 1581 disks or files with 1 or 2 1581's
- Supplied on both 3½" and 5¼" diskettes so that it will load on either the 1571 or 1581 drive.
- Perform numerous DOS functions such as rename a disk, rename a file, scratch or unscratch files, lock or unlock files, create auto-boot and much more!

Super 81 Utilities uses an option window to display all choices available at any given time. A full featured disk utilities system for the 1581 for only

Super 81 Utilities is now available for the C64!

$39.95!

RAMDOS — Lightning Fast RAM-DISK

RAMDOS is a complete RAM based "Disk" Operating System for the Commodore 1700 and 1750 RAM expansion modules which turns all or part of the expansion memory into a lightning fast RAM-DISK. RAMDOS behaves similar to a much faster 1541 or 1571 floppy disk except that the data is held in expansion RAM and not on disk. Under RAMDOS, a 50K program can be loaded in ½ second. Programs and files can be transferred to and from disk with a single command. RAMDOS is available for only **$39.95!**

GAMES

EYE OF THE INCA

Four text adventures on one disk for the C64 and Apple II series computers. Eye of the Inca, Shipwrecked, Son of Ali Baba and Perils of Darkest Africa. Four perilous adventures for only **$19.95!**

REVENGE OF THE MOON GODDESS

Four text adventures on one disk for the C64 and Apple II series computers. Revenge of the Moon Goddess, Frankenstein's Legacy, Night of the Walking Dead and The Sea Phantom. Four terrifying adventures for only **$19.95!**

SEX VIXENS FROM SPACE

Three text adventures for the C64 and Apple II series for MATURE ADULTS ONLY. Sex Vixens from Space, Bite of the Sorority Vampires and Hatchet Honeymoon. Three sizzling adult adventures for only **$29.95!**

SUPER BIKE

Action-packed, fun-filled motor cycle arcade game for the C64. Race the clock in Motocross, Enduro, Supercross or Trials. Fly through the air on spectacular jumps. Bounce over woop-de-doos. Avoid logs, trees, water holes, brick walls, other bikers, etc. as you vie for the gold cup.

Thrilling **Super Bike** action for only **$14.95!**

GALACTIC FRONTIER

Exciting space exploration game for the C64. Search for life forms among the 200 billion stars in our galaxy. Scientifically accurate. Awesome graphics! For the serious student of astronomy or the casual explorer who wants to boldly go where no man has gone before.

Only **$29.95!**

Order with check, money order, VISA, MasterCard, COD. Free shipping & handling on US, Canadian, APO,FPO orders. COD & Foreign orders add $4.00

MasterCard VISA

Order From: **Free Spirit Software, Inc.**
905 W. Hillgrove, Suite 6
LaGrange, IL 60525
(312) 352-7323
1-800-552-6777
For Technical Assistance call: **(312)352-7335**

In England contact Financial Systems Software 0905-611-463

MLX Machine Language Entry Program For Commodore 64 and 128

Ottis R. Cowper

"MLX" is a labor-saving utility that allows almost fail-safe entry of machine language programs. Included are versions for the Commodore 64 and 128.

Type in and save some copies of whichever version of MLX is appropriate for your computer (you'll want to use it to enter future ML programs from COMPUTE!'s GAZETTE). Program 1 is for the Commodore 64, and Program 2 is for the 128 (128 MLX can also be used to enter Commodore 64 ML programs for use in 64 mode). When you're ready to enter an ML program, load and run MLX. It asks you for a starting address and an ending address. These addresses appear in the article accompanying the MLX-format program listing you're typing.

If you're unfamiliar with machine language, the addresses (and all other values you enter in MLX) may appear strange. Instead of the usual decimal numbers you're accustomed to, these numbers are in *hexadecimal*—a base 16 numbering system commonly used by ML programmers. Hexadecimal—hex for short—includes the numerals 0–9 and the letters A–F. But don't worry—even if you know nothing about ML or hex, you should have no trouble using MLX.

After you enter the starting and ending addresses, you'll be offered the option of clearing the workspace. Choose this option if you're starting to enter a new listing. If you're continuing a listing that's partially typed from a previous session, don't choose this option.

A functions menu will appear. The first option in the menu is ENTER DATA. If you're just starting to type in a program, pick this. Press the E key, and type the first number in the first line of the program listing. If you've already typed in part of a program, type the line number where you left off typing at the end of the previous session (be sure to load the partially completed program before you resume entry). In any case, make sure the address you enter corresponds to the address of a line in the listing you are entering. Otherwise, you'll be unable to enter the data correctly. If you pressed E by mistake, you can return to the command menu by pressing RETURN alone when asked for the address. (You can get back to the menu from most options by pressing RETURN with no other input.)

Entering A Listing

Once you're in Enter mode, MLX prints the address for each program line for you. You then type in all nine numbers on that line, beginning with the first two-digit number after the colon (:). Each line represents eight data bytes and a checksum. Although an MLX-format listing appears similar to the "hex dump" listings from a machine language monitor program, the extra checksum number on the end allows MLX to check your typing. (Commodore 128 users *can* enter the data from an MLX listing using the built-in monitor if the rightmost column of data is omitted, but we recommend against it. It's much easier to let MLX do the proofreading and error checking for you.)

When you enter a line, MLX recalculates the checksum from the eight bytes and the address and compares this value to the number from the ninth column. If the values match, you'll hear a bell tone, the data will be added to the workspace area, and the prompt for the next line of data will appear. But if MLX detects a typing error, you'll hear a low buzz and see an error message. The line will then be redisplayed for editing.

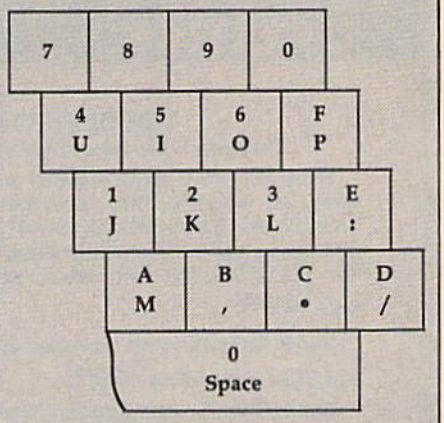
Invalid Characters Banned

Only a few keys are active while you're entering data, so you may have to unlearn some habits. You *do not* type spaces between the columns; MLX automatically inserts these for you. You *do not* press RETURN after typing the last number in a line; MLX automatically enters and checks the line after you type the last digit.

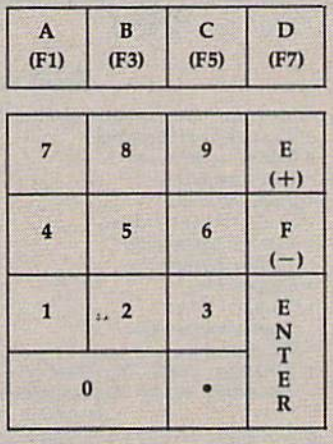
Only the numerals 0–9 and the letters A–F can be typed in. If you press any other key (with some exceptions noted below), you'll hear a warning buzz. To simplify typing, 128 MLX redefines the function keys and + and − keys on the numeric keypad so that you can enter data one-handed. (The 64 version incorporates the keypad modification from the March 1986 "Bug-Swatter" column, lines 485–487.) In either case, the keypad is active only while entering data. Addresses must be entered with the normal letter and number keys. The figures above show the keypad configurations for each version.

MLX checks for transposed characters. If you're supposed to type in A0 and instead enter 0A, MLX will catch your mistake. There is one error that can slip past MLX: Because of the checksum formula used, MLX won't notice if you accidentally type FF in place of 00, and vice versa. And there's a very slim chance that you could garble a line and still end up with a combination of characters that adds up to the proper checksum. However, these mistakes should not occur if you take reasonable care while entering data.

64 MLX Keypad



128 MLX Keypad



Editing Features

To correct typing mistakes before finishing a line, use the INST/DEL key to delete the character to the left of the cursor. (The cursor-left key also deletes.) If you mess up a line really badly, press CLR/HOME to start the line over. The RETURN key is also active, but only before any data is typed on a line. Pressing RETURN at this point returns you to the command menu. After you type a character of data, MLX disables RETURN until the cursor returns to the start of a line. Remember, you can press CLR/HOME to quickly get to a line

S & S Wholesalers, Inc.

226 Lincoln Road • Miami Beach, Florida 33139

Customer Service
305-538-1364

Dealer & Institutional Accts. 1-800-331-7054

SALES 1-800-233-6345

Commodore 64C COMPUTER

129.90*

*WITH THE PURCHASE OF SPECIAL SOFTWARE PACKAGE

STAR MICRONICS PRINTER

- 80 COLUMN PRINTER
- FULL GRAPHICS CAPABILITY
- 100% COMMODORE COMPATIBLE
- 1 YEAR WARRANTY

PANASONIC 1081 II	149.00*	OKIDATA 180	224.00*
PANASONIC 1091 II	169.00*	STAR NX1000	149.00*
PANASONIC 3131	249.00*	ESPON LX800	189.00*
PANASONIC 1524	569.00*	EPSON FX286E	479.00*
OKIMATE 20	119.00*	EPSON EX800	CALL
OKIDATA 120	179.00*	HW-10	99.00*

*WITH PURCHASE OF STARTER KIT

"1670" CLONE 1200 BAUD MODEM

DIRECT CONNECT WITH SOFTWARE

89.90

COMMODORE 300 BAUD DIRECT CONNECT MODEM

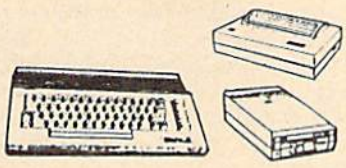
19.90

5¼" DSDD DISKETTES

19¢* 100% CERTIFIED & GUARANTEED

*MIN. 50 W/PURCHASE OF DISK FILE

Commodore 128-D WORD PROCESSING SYSTEM



629.90

- Commodore 128-D Computer w/ built-in 360K double sided disk drive
- HI Resolution 80 column monitor w/cable
- 80 Column High Speed Graphics Printer with interface & cables
- Word Processing & Database Software

1750 RAM EXPANDER	169.90
6 OUTLET SURGE PROTECTOR	18.90
C64 POWER SUPPLY	28.90

COLOR MONITOR

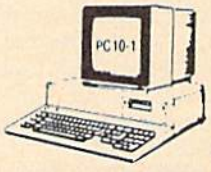
139.90.

*With Purchase of Blare Guard

COMMODORE AMIGA 500

CALL

Commodore PC



CALL

HI RESOLUTION MONOCHROME MONITOR

40/80 Column Display

89.90

SOFTWARE

BERKLEY SOFTWORKS

GEOS	34.90
GEOS 128	41.97
GEO PUBLISH	41.97
GEOPROGRAMMER	41.97
DESK PAK - 1	14.97
FONT PAK - 1	14.97
GEO - DEX	14.97
DESK PAK II	CALL
GEOWRITE	29.97
GEOCALC	29.97
GEOFILE	29.97

ACCESS

ECHELON	26.97
MACH 128	29.97
MACH 5	20.97
LEADERBOARD	23.00
TRIPLE PAK	11.97
WORLD CLASS LEADERBOARD	23.97

SUBLOGIC/ACTION SOFT

FLIGHT SIMULATOR II	32.77
THUDER CHOPPER	17.77
UD PERISCOPE	17.77
SCENERY DISK 1-12	ea. 14.77
JET	25.97

DADAEAST

BREAK THROUGH	20.77
COMMANDO	20.77
IKARI WARRIOR	17.77
KUNG FU FASER	14.77
TAG TEAM WRESTLING	17.77

BRODERBUND

PRINTSHOP	26.97
KARATEKA	17.77
WHERE IN THE U.S.A. IS CARMEN SAN DIEGO	23.97
PRINTSHOP COMPANION	23.97
BANK ST. WRITER	29.97

TIMEWORKS

WORDWRITER 128 I	24.90
PARTNER 128	24.90
SWIFTCALC 128	24.90
DATAMANAGER 128	24.90
DESKTOP PUBLISHER	CALL

ACCOLADE

DAMBUSTERS	16.00
FIGHT NIGHT	17.77
4th & INCHES	17.77
SPY US SPY	9.77
KILLED UNTIL DEAD	17.77
TEST DRIVE	17.77

DIGITAL SOLUTIONS

POCKET DICTIONARY	8.97
POCKET WRITER II	28.77
POCKET FILER II	28.77
POCKET PLANNER II	28.77
SUPERPACK II	59.97

GAMESTAR

CHAMPIONSHIP BASEBALL	20.97
CHAMPIONSHIP FOOTBALL	20.97
STAR RANKBOXING	17.77
TOP FUEL ELIMINATOR	17.77

EPYX

CALIFORNIA CAMES	23.77
CHAMPIONSHIP WRESTLING	23.77
FAST LOAD	23.77
RAD WARRIOR	17.77
STREET SPORTS	23.77
WINTER GAMES	23.77
WORLD GAMES	23.77

ELECTORNIC ARTS

ADVENTURE CONST.	11.77
AMNESIA	24.77
ARTIC FOX	24.77
BAROS TALE II	24.77
CHESSMASTER 2000	24.77
DRAGONS LAIR	19.77
HOME PAK	14.97
FINANCIAL COOKBOOK	12.77
INSTANT MUSIC	20.77
MULE	11.77
LEGACY OF THE ACIENTS	20.77
MARBLE MADNESS	19.77
ULTIMA I/III/IV	CALL
SKY FOX II	CALL
PAPERCLIP	18.97

PROGRESSIVE

BOBS TEAM PRO	29.77
SUPERSCRIPT	29.77
SUPERBASE 64	47.77
SUPERBASE 128	52.77
SUPERSCRIPT 128	52.77

MICROPROSE

AIRBORNE RANGER	20.97
CONFLICT IN VIETNAM	23.97
F15 STRIKE EAGLE	20.97
GUNSHIP	20.97
PIRATES	23.97
STEALTH FIGHTER	23.97
SILENT SERVICE	23.97

MINDSCAPE

BOP N WRESTLE	17.77
DEFENDER OF THE CROWN	20.77
GAUNTLET	20.77
INDOORSPORTS	20.77
KING OF CHICAGO	20.77
PAPERBOY	20.77
SDI	20.77

CLOSEOUTS

	WAS	NOW
HOME ACCOUNTANT	74.95	24.90
PAPERCLIP II	79.95	19.90
EASY SCRIPT	69.95	12.90
JANE 128	99.90	14.90
LOGO	69.90	29.90
MS PAC MAN	29.90	7.77
PAC MAN	29.90	7.77
ZORK II	39.90	6.77
ZORK III	49.90	6.77
DEADLINE	59.90	6.77
SUSPENDED	49.90	6.77

FREE FREIGHT ON ORDERS OVER $100.00 All prices reflect a 3% cash discount. Add 3% for credit card purchases. C.O.D. orders add $4.00 per box. Orders under $100.00 add $4.00 shipping and handling. Quantities on some items may be limited. Prices are subject to change without notice. APA, FPO add 6% additional shipping. Foreign orders actual freight charged. All sales are final. Return of defective merchandise for replacement only with authorization. Authorized returns are subject to a restocking fee. Complete listing of all sales policies available upon request. Florida residents add 6% sales tax.

number prompt.

More editing features are available when correcting lines in which MLX has detected an error. To make corrections in a line that MLX has redisplayed for editing, compare the line on the screen with the one printed in the listing, then move the cursor to the mistake and type the correct key. The cursor left and right keys provide the normal cursor controls. (The INST/DEL key now works as an alternative cursor-left key.) You cannot move left beyond the first character in the line. If you try to move beyond the rightmost character, you'll reenter the line. During editing, RETURN is active; pressing it tells MLX to recheck the line. You can press the CLR/HOME key to clear the entire line if you want to start from scratch, or if you want to get to a line number prompt to use RETURN to get back to the menu.

Display Data

The second menu choice, DISPLAY DATA, examines memory and shows the contents in the same format as the program listing (including the checksum). When you press D, MLX asks you for a starting address. Be sure that the starting address you give corresponds to a line number in the listing. Otherwise, the checksum display will be meaningless. MLX displays program lines until it reaches the end of the program, at which point the menu is redisplayed. You can pause the display by pressing the space bar. (MLX finishes printing the current line before halting.) Press space again to restart the display. To break out of the display and get back to the menu before the ending address is reached, press RETURN.

Other Menu Options

Two more menu selections let you save programs and load them back into the computer. These are SAVE FILE and LOAD FILE; their operation is quite straightforward. When you press S or L, MLX asks you for the filename. You'll then be asked to press either D or T to select disk or tape.

You'll notice the disk drive starting and stopping several times during a load or save (save only for the 128 version). Don't panic; this is normal behavior. MLX opens and reads from or writes to the file instead of using the usual LOAD and SAVE commands (128 MLX makes use of BLOAD). Disk users should also note that the drive prefix 0: is automatically added to the filename (line 750 in 64 MLX), so this should *not* be included when entering the name. This also precludes the use of @ for Save-with-Replace, so remember to give each version you save a different name. The 128 version makes up for this by giving you the option of scratching the existing file if you want to reuse a filename.

Remember that MLX saves the entire workspace area from the starting address to the ending address, so the save or load may take longer than you might expect if you've entered only a small amount of data from a long listing. When saving a partially completed listing, make sure to note the address where you stopped typing so you'll know where to resume entry when you reload.

MLX reports the standard disk or tape error messages if any problems are detected during the save or load. (Tape users should bear in mind that Commodore computers are never able to detect errors during a save to tape.) MLX also has three special load error messages: INCORRECT STARTING ADDRESS, which means the file you're trying to load does not have the starting address you specified when you ran MLX; LOAD ENDED AT *address*, which means the file you're trying to load ends before the ending address you specified when you started MLX; and TRUNCATED AT ENDING ADDRESS, which means the file you're trying to load extends beyond the ending address you specified when you started MLX. If you see one of these messages and feel certain that you've loaded the right file, exit and rerun MLX, being careful to enter the correct starting and ending addresses.

The 128 version also has a CATALOG DISK option so you can view the contents of the disk directory before saving or loading.

The QUIT menu option has the obvious effect—it stops MLX and enters BASIC. The RUN/STOP key is disabled, so the Q option lets you exit the program without turning off the computer. (Of course, RUN/STOP-RESTORE also gets you out.) You'll be asked for verification; press Y to exit to BASIC, or any other key to return to the menu. After quitting, you can type RUN again and reenter MLX without losing your data, as long as you don't use the clear workspace option.

The Finished Product

When you've finished typing all the data for an ML program and saved your work, you're ready to see the results. The instructions for loading and using the finished product vary from program to program. Some ML programs are designed to be loaded and run like BASIC programs, so all you need to type is LOAD *"filename"*,8 for disk (DLOAD *"filename"* on the 128) or LOAD *"filename"* for tape, and then RUN. Such programs will usually have a starting address of 0801 for the 64 or 1C01 for the 128. Other programs must be reloaded to specific addresses with a command such as LOAD *"filename"*,8,1 for disk (BLOAD *"filename"* on the 128) or LOAD *"filename"*,1,1 for tape, then started with a SYS to a particular memory address. On the Commodore 64, the most common starting address for such programs is 49152, which corresponds to MLX address C000. In either case, you should always refer to the article which accompanies the ML listing for information on loading and running the program.

An Ounce Of Prevention

By the time you finish typing in the data for a long ML program, you may have several hours invested in the project. Don't take chances—use our "Automatic Proofreader" to type the new MLX, and then test your copy *thoroughly* before first using it to enter any significant amount of data. Make sure all the menu options work as they should. Enter fragments of the program starting at several different addresses, then use the Display option to verify that the data has been entered correctly. And be sure to test the Save and Load options several times to ensure that you can recall your work from disk or tape. Don't let a simple typing error in the new MLX cost you several nights of hard work.

Program 1: MLX For Commodore 64

```
SS 10 REM VERSION 1.1: LINES 8
      30,950 MODIFIED, LINES 4
      85-487 ADDED
EK 100 POKE 56,50:CLR:DIM IN$,
      I,J,A,B,A$,B$,A(7),N$
DM 110 C4=48:C6=16:C7=7:Z2=2:Z
      4=254:Z5=255:Z6=256:Z7=
      127
CJ 120 FA=PEEK(45)+Z6*PEEK(46)
      :BS=PEEK(55)+Z6*PEEK(56
      ):H$="0123456789ABCDEF"
SB 130 R$=CHR$(13):L$="{LEFT}"
      :S$=" ":D$=CHR$(20):Z$=
      CHR$(0):T$="{13 RIGHT}"
CQ 140 SD=54272:FOR I=SD TO SD
      +23:POKE I,0:NEXT:POKE
      {SPACE}SD+24,15:POKE 78
      8,52
FC 150 PRINT"{CLR}"CHR$(142)CH
      R$(8):POKE 53280,15:POK
      E 53281,15
EJ 160 PRINT T$" {RED}{RVS}
      {2 SPACES}{8 @}
      {2 SPACES}"SPC(28)"
      {2 SPACES}{OFF}{BLU} ML
      X II {RED}{RVS}
      {2 SPACES}"SPC(28)"
      {12 SPACES}{BLU}"
FR 170 PRINT"{3 DOWN}
      {3 SPACES}COMPUTE!'S MA
      CHINE LANGUAGE EDITOR
      {3 DOWN}"
JB 180 PRINT"{BLK}STARTING ADD
```

COMPUTER DISCOUNTS ON ALL YOUR COMPUTER NEEDS

MIBRO COMPANY

COMPUTER DISCOUNTS ON ALL YOUR COMPUTER NEEDS

64 WEST 36th ST., NYC, NY 10018

OUR ONLY STORE!! ESTABLISHED SINCE 1950

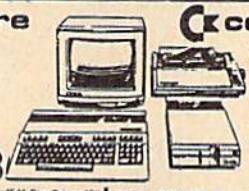
COMMODORE 128D/20 PIECE OUTFIT

OUTFIT INCLUDES: Commodore 128D Keyboard With Built In 1571 Disc Drive •Commodore RGB Color Monitor •Commodore Printer •AC Adapter •Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes

$798

commodore

COMMODORE 64-C 20 PIECE DELUXE PACKAGE OUTFIT $368



OUTFIT INCLUDES: Commodore 64 C Keyboard •1541 Disc Drive •12" Computer Monitor •Commodore Printer •AC Adapter Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes

commodore

COMMODORE 64-C 20 PIECE DREAM OUTFIT $488

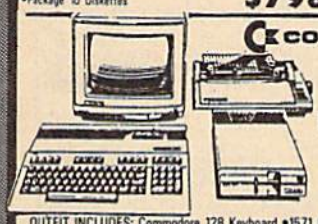
OUTFIT INCLUDES: Commodore 64 C Keyboard •1541 Disc Drive •Commodore Color Monitor •Commodore Printer •AC Adapter •Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes

commodore

AMIGA 500 AMIGA 500 TOP OF THE LINE OUTFIT

OUTFIT INCLUDES: Amiga 500 With Built In Drive •Amiga RGB Color Monitor •Printer For Amiga •Package 10 Diskettes •Disc Drive Head Cleaner •Owners Manual •USA Guarantee

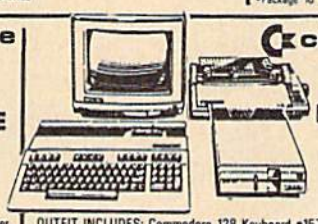
$848



commodore

128 DREAM PACKAGE OUTFIT $488

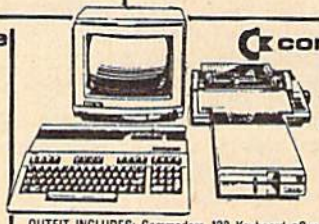
OUTFIT INCLUDES: Commodore 128 Keyboard •1571 Disc Drive •12" Computer Monitor •Commodore Printer •AC Adapter •Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes



commodore

128 PROFESSIONAL OUTFIT $568

OUTFIT INCLUDES: Commodore 128 Keyboard •1571 Disc Drive •Commodore Color Monitor •Commodore Printer •AC Adapter •Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes



commodore

128 TOP OF THE LINE OUTFIT $648

OUTFIT INCLUDES: Commodore 128 Keyboard •Commodore 1571 Disc Drive •Commodore RGB Color Monitor •Commodore Printer •AC Adapter •Owners Manual •Disc Drive Head Cleaner •Package 10 Diskettes

'CHOOSE YOUR OWN PACKAGE DEAL'

MIX & MATCH THE COMPUTER SYSTEM THAT'S GOOD FOR YOU & ONE OF OUR COMPUTER SPECIALISTS WILL GIVE YOU A SPECIAL PRICE!

BLUE CHIP 25 PIECE PACKAGE WITH PRINTER IBM XT COMPATIBLE®

$598 *Includes Star Printer*

FEATURES INCLUDE: 512K Ram Expandable to 640K Ram •6 Expansion Slots •Parallel & Serial Ports •Opt. 20 MB Hard Drive

PACKAGE INCLUDES: Blue Chip Keyboard W/360K Floppy Drive •12" Computer Monitor •Package 10 Diskettes •Disc Drive Head Cleaner •Word Processor •Spread Sheet •Data Base

WITH: 20 MEGABYTE HARD DRIVE.....$798
WITH: 30 MEGABYTE HARD DRIVE.....$848
WITH: 40 MEGABYTE HARD DRIVE.....$948

COMMODORE PC10-I 25 PIECE PACKAGE WITH PRINTER IBM XT COMPATIBLE®

$598 *Includes Star Printer*

FEATURES INCLUDE: 512K Ram Expandable to 640K •6 Expansion Slots •Parallel & Serial Ports •Opt. 20MB Hard Drive

PACKAGE INCLUDES: Commodore PC-10-I Keyboard W/360K Floppy Drive •12" Computer Monitor •Package 10 Diskettes •Disc Drive Head Cleaner •Word Processor •Spread Sheet •Data Base

WITH: 20 MEGABYTE HARD DRIVE.....$798
WITH: 30 MEGABYTE HARD DRIVE.....$848
WITH: 40 MEGABYTE HARD DRIVE.....$948

LEADING EDGE/MODEL D 25 PIECE PACKAGE WITH PRINTER IBM XT COMPATIBLE®

$798 *Includes Star Printer*

FEATURES INCLUDE: 8088 Processor •360K Floppy Drive •Switchable 4.77/16 Megahertz •Opt. 20 MB & 30MB Hard Drive

PACKAGE INCLUDES: Leading Edge Keyboard •Disc Drive •10 Diskettes •12" Computer Monitor •Disc Drive Head Cleaner •Owners Manual •AC Adapter •360K Floppy Drive •Word Processor •Spread Sheet •Data Base

WITH: 20 MEGABYTE HARD DRIVE.....$998
WITH: 30 MEGABYTE HARD DRIVE.....$1048
WITH: 40 MEGABYTE HARD DRIVE.....$1148

EPSON EQUITY II 25 PIECE PACKAGE WITH PRINTER IBM XT COMPATIBLE®

$798 *Includes Star Printer*

FEATURES INCLUDE: 640K Ram •4.77/7.13 Switchable Megahertz •Parallel & Serial Ports

PACKAGE INCLUDES: Equity II Keyboard W/640K Floppy Drive •12" Computer Monitor •Package 10 Diskettes •Disc Drive Head Cleaner •Word Processor •Spread Sheet •Data Base

WITH: 20 MEGABYTE HARD DRIVE.....$998
WITH: 30 MEGABYTE HARD DRIVE.....$1048
WITH: 40 MEGABYTE HARD DRIVE.....$1148

VENDEX HEAD START IBM XT COMPATIBLE®

FEATURES INCLUDE: 8088 Processor •4.77/8 Switchable Megahertz •Dual Floppy Drive •7 Expansion Slots •512K Ram Expandable To 768K Ram •Parallel & Serial Ports •Mouse •Game •Light Pen Port

PRICED TOO LOW TO ADVERTISE!!

BONUS: OVER $500 WORTH OF SOFTWARE BONUS: OVER $1000 WORTH OF COUPONS NO CHARGE AVAILABLE WITH: 20 MEGABYTE HARD DRIVE

COMMODORE AMIGA 2000 CALL FOR NEW LOW PRICE!

FEATURES INCLUDE: 1 MB Memory Expandable To 9 MB •Built-In Seriel Centronics •RGB •Video Ports •Built-In Mouse

ALSO AVAILABLE: AMIGA 2002 •MONITOR •3.5 INTERNAL DRIVE •BRIDGE CARD •HARD DRIVE CONTROLLER •2MB RAM EXPANDER PACKAGE DEALS AVAILABLE!!

NEW PRODUCTS FROM commodore

COMMODORE 128D

FEATURES INCLUDE: 128K Ram Memory •Built In 5¼" Double Sided Floppy Drive •Detachable 128 Keyboard

CALL FOR SPECIAL LOW PRICES!!

COMMODORE 1581

FEATURES INCLUDE: 3.5" 360K Double Density Disc Drive For Use With Commodore Computers

CALL FOR SPECIAL LOW PRICES!!

COMMODORE 1084

FEATURES INCLUDE: High Resolution •RGB Color Monitor For Commodore Computers

CALL FOR SPECIAL LOW PRICES!!

commodore HARDWARE & SOFTWARE

COMMODORE 128 Computer	COMMODORE 1351 Mouse
COMMODORE 64 Computer	COMMODORE 1701 Monitor
COMMODORE 64-C Computer	COMMODORE 1801 Monitor
COMMODORE 128D Computer	COMMODORE 1902 Monitor
COMMODORE 1541 Disc Drive	COMMODORE 2002 Monitor
COMMODORE 1541-C Disc Drive	COMMODORE 1080 Monitor
COMMODORE 1541-II Disc Drive	COMMODORE 1084 Monitor
COMMODORE 1571 Disc Drive	COMMODORE 801 Printer
COMMODORE 1660 Modem	COMMODORE 803 Printer
COMMODORE 1670 Modem	COMMODORE MPS-1000 Printer
COMMODORE 1764 Expander	COMMODORE MPS-1200 Printer
COMMODORE 1700 Expander	COMMODORE MPS-1250 Printer
COMMODORE 1750 Expander	

ITEMS SOLD SEPARATELY CALL NOW FOR NEW LOW PRICES!!

TOP 20 BEST SELLING PRINTERS FOR COMMODORE & IBM

SEIKOSHA 180VC	OKIMATE 20
SEIKOSHA 1000VC	OKIDATA 120
SEIKOSHA 1200AI	OKIDATA 180
EPSON LX-800	STAR NX-10
EPSON LX-86	STAR NP-10
EPSON LQ-500	STAR NX-10C
EPSON LQ-800	STAR NX-1000
EPSON FX-86E	STAR NX-1000C
EPSON FX-286E	STAR NX-15
OKIMATE10	STAR NB-2415

CALL FOR NEW LOW PRICES!!!

ORDER NOW!! PHONE ORDERS ONLY CALL TOLL FREE

1 (800) 223-0322

FOR INFORMATION CALL (212) 695-7133

NEW YORK STATE RESIDENTS CALL (212) 695-7133/695-7134

ON ALL PHONE ORDERS PLEASE CALL
MON.-SAT. 10:00AM-7:30PM
SUNDAY 10:00 AM-6:00 PM

Use Master Card, Visa, American Express, or Send Money Order, Certified Check.

WE NOW TAKE DISCOVER & DINERS CLUB

MIBRO CO., INC.

64 West 36th Street, New York, N.Y. 10018
MON. THRU SAT. 10:00AM-7:30PM SUN. 10AM-6PM

All merchandise brand new factory fresh. Minimum shipping and handling charge $4.95 Shipping charges non-refundable. For mail orders please call before sending in money order. No money orders will be excepted without orders. All prices subject to change without notice. Quantities may be limited on some items. Refunds within seven days with original packaging and unfilled guarantee card. All orders subject to acceptance and verification. Prices subject to manufacturers increase and or decrease. Not responsible for typographical errors. For information please call customer service, please call between 12:30 pm-6:30 pm. Prices good for mail order only. Pictures are for illustration and may not be exact. Department of Consumer Affairs License No. 800-253. No returns accepted without prior verbal authorization.

```
      RESS[4]";:GOSUB300:SA=A
      D:GOSUB1040:IF F THEN18
      0
GF 190 PRINT"{BLK}{2 SPACES}EN
      DING ADDRESS[4]";:GOSUB
      300:EA=AD:GOSUB1030:IF
      {SPACE}F THEN190
KR 200 INPUT"{3 DOWN}{BLK}CLEA
      R WORKSPACE [Y/N][4]";A
      $:IF LEFT$(A$,1)<>"Y"TH
      EN220
PG 210 PRINT"{2 DOWN}{BLU}WORK
      ING...";:FORI=BS TO BS+
      EA-SA+7:POKE I,0:NEXT:P
      RINT"DONE"
DR 220 PRINTTAB(10)"{2 DOWN}
      {BLK}{RVS} MLX COMMAND
      {SPACE}MENU {DOWN}[4]":
      PRINT T$"{RVS}E{OFF}NTE
      R DATA"
BD 230 PRINT T$"{RVS}D{OFF}ISP
      LAY DATA":PRINT T$"
      {RVS}L{OFF}OAD FILE"
JS 240 PRINT T$"{RVS}S{OFF}AVE
       FILE":PRINT T$"{RVS}Q
      {OFF}UIT{2 DOWN}{BLK}"
JH 250 GET A$:IF A$=N$ THEN250
HK 260 A=0:FOR I=1 TO 5:IF A$=
      MID$("EDLSQ",I,1)THEN A
      =I:I=5
FD 270 NEXT:ON A GOTO420,610,6
      90,700,280:GOSUB1060:GO
      TO250
EJ 280 PRINT"{RVS} QUIT ":INPU
      T"{DOWN}[4]ARE YOU SURE
       [Y/N]";A$:IF LEFT$(A$,
      1)<>"Y"THEN220
EM 290 POKE SD+24,0:END
JX 300 IN$=N$:AD=0:INPUTIN$:IF
      LEN(IN$)<>4THENRETURN
KF 310 B$=IN$:GOSUB320:AD=A:B$
      =MID$(IN$,3):GOSUB320:A
      D=AD*256+A:RETURN
PP 320 A=0:FOR J=1 TO 2:A$=MID
      $(B$,J,1):B=ASC(A$)-C4+
      (A$>"@")*C7:A=A*C6+B
JA 330 IF B<0 OR B>15 THEN AD=
      0:A=-1:J=2
GX 340 NEXT:RETURN
CH 350 B=INT(A/C6):PRINT MID$(
      H$,B+1,1);:B=A-B*C6:PRI
      NT MID$(H$,B+1,1);:RETU
      RN
RR 360 A=INT(AD/Z6):GOSUB350:A
      =AD-A*Z6:GOSUB350:PRINT
      ":";
BE 370 CK=INT(AD/Z6):CK=AD-Z4*
      CK+Z5*(CK>Z7):GOTO390
PX 380 CK=CK*Z2+Z5*(CK>Z7)+A
JC 390 CK=CK+Z5*(CK>Z5):RETURN
QS 400 PRINT"{DOWN}STARTING AT
      [4]";:GOSUB300:IF IN$<>
      N$ THEN GOSUB1030:IF F
      {SPACE}THEN400
EX 410 RETURN
HD 420 PRINT"{RVS} ENTER DATA
      {SPACE}":GOSUB400:IF IN
      $=N$ THEN220
JK 430 OPEN3,3:PRINT
SK 440 POKE198,0:GOSUB360:IF F
       THEN PRINT IN$:PRINT"
      {UP}{5 RIGHT}";
GC 450 FOR I=0 TO 24 STEP 3:B$
      =S$:FOR J=1 TO 2:IF F T
      HEN B$=MID$(IN$,I+J,1)
HA 460 PRINT"{RVS}"B$L$;:IF I<
      24THEN PRINT"{OFF}";
HD 470 GET A$:IF A$=N$ THEN470
FK 480 IF(A$>"/"ANDA$<":")OR(A
      $>"@"ANDA$<"G")THEN540
GS 485 A=-(A$="M")-2*(A$=",")-
      3*(A$=".")-4*(A$="/")-5
      *(A$="J")-6*(A$="K")
FX 486 A=A-7*(A$="L")-8*(A$=:
      ")-9*(A$="U")-10*(A$="I
      ")-11*(A$="O")-12*(A$="
      P")
CM 487 A=A-13*(A$=S$):IF A THE
      N A$=MID$("ABCD123E456F
      0",A,1):GOTO 540
MP 490 IF A$=R$ AND((I=0)AND(J
      =1)OR F)THEN PRINT B$;:
      J=2:NEXT:I=24:GOTO550
KC 500 IF A$="{HOME}" THEN PRI
      NT B$:J=2:NEXT:I=24:NEX
      T:F=0:GOTO440
MX 510 IF(A$="{RIGHT}")ANDF TH
      ENPRINT B$L$;:GOTO540
GK 520 IF A$<>L$ AND A$<>D$ OR
      ((I=0)AND(J=1))THEN GOS
      UB1060:GOTO470
HG 530 A$=L$+S$+L$:PRINT B$L$;
      :J=2-J:IF J THEN PRINT
      {SPACE}L$;:I=I-3
QS 540 PRINT A$;:NEXT J:PRINT
      {SPACE}S$;
PM 550 NEXT I:PRINT:PRINT"{UP}
      {5 RIGHT}";:INPUT#3,IN$
      :IF IN$=N$ THEN CLOSE3:
      GOTO220
QC 560 FOR I=1 TO 25 STEP3:B$=
      MID$(IN$,I):GOSUB320:IF
       I<25 THEN GOSUB380:A(I
      /3)=A
PK 570 NEXT:IF A<>CK THEN GOSU
      B1060:PRINT"{BLK}{RVS}
      {SPACE}ERROR: REENTER L
      INE [4]":F=1:GOTO440
HJ 580 GOSUB1080:B=BS+AD-SA:FO
      R I=0 TO 7:POKE B+I,A(I
      ):NEXT
QQ 590 AD=AD+8:IF AD>EA THEN C
      LOSE3:PRINT"{DOWN}{BLU}
      ** END OF ENTRY **{BLK}
      {2 DOWN}":GOTO700
GQ 600 F=0:GOTO440
QA 610 PRINT"{CLR}{DOWN}{RVS}
      {SPACE}DISPLAY DATA ":G
      OSUB400:IF IN$=N$ THEN2
      20
RJ 620 PRINT"{DOWN}{BLU}PRESS:
       {RVS}SPACE{OFF} TO PAU
      SE, {RVS}RETURN{OFF} TO
       BREAK[4]{DOWN}"
KS 630 GOSUB360:B=BS+AD-SA:FOR
      I=BTO B+7:A=PEEK(I):GOS
      UB350:GOSUB380:PRINT S$
      ;
CC 640 NEXT:PRINT"{RVS}";:A=CK
      :GOSUB350:PRINT
KH 650 F=1:AD=AD+8:IF AD>EA TH
      ENPRINT"{DOWN}{BLU}** E
      ND OF DATA **":GOTO220
KC 660 GET A$:IF A$=R$ THEN GO
      SUB1080:GOTO220
EQ 670 IF A$=S$ THEN F=F+1:GOS
      UB1080
AD 680 ONFGOTO630,660,630
CM 690 PRINT"{DOWN}{RVS} LOAD
      {SPACE}DATA ":OP=1:GOTO
      710
PC 700 PRINT"{DOWN}{RVS} SAVE
      {SPACE}FILE ":OP=0
RX 710 IN$=N$:INPUT"{DOWN}FILE
      NAME[4]";IN$:IF IN$=N$
      {SPACE}THEN220
PR 720 F=0:PRINT"{DOWN}{BLK}
      {RVS}T{OFF}APE OR {RVS}
      D{OFF}ISK: [4]";
FP 730 GET A$:IF A$="T"THEN PR
      INT"T{DOWN}":GOTO880
HQ 740 IF A$<>"D"THEN730
HH 750 PRINT"D{DOWN}":OPEN15,8
      ,15,"I0:":B=EA-SA:IN$="
      0:"+IN$:IF OP THEN810
SQ 760 OPEN 1,8,8,IN$+",P,W":G
      OSUB860:IF A THEN220
FJ 770 AH=INT(SA/256):AL=SA-(A
      H*256):PRINT#1,CHR$(AL)
      ;CHR$(AH);
PE 780 FOR I=0 TO B:PRINT#1,CH
      R$(PEEK(BS+I));:IF ST T
      HEN800
FC 790 NEXT:CLOSE1:CLOSE15:GOT
      O940
GS 800 GOSUB1060:PRINT"{DOWN}
      {BLK}ERROR DURING SAVE:
      [4]":GOSUB860:GOTO220
MA 810 OPEN 1,8,8,IN$+",P,R":G
      OSUB860:IF A THEN220
GE 820 GET#1,A$,B$:AD=ASC(A$+Z
      $)+256*ASC(B$+Z$):IF AD
      <>SA THEN F=1:GOTO850
RX 830 FOR I=0 TO B:GET#1,A$:P
      OKE BS+I,ASC(A$+Z$):IF(
      I<>B)AND ST THEN F=2:AD
      =I:I=B
FA 840 NEXT:IF ST<>64 THEN F=3
FQ 850 CLOSE1:CLOSE15:ON ABS(F
      >0)+1 GOTO960,970
SA 860 INPUT#15,A,A$:IF A THEN
       CLOSE1:CLOSE15:GOSUB10
      60:PRINT"{RVS}ERROR: "A
      $
GQ 870 RETURN
EJ 880 POKE183,PEEK(FA+2):POKE
      187,PEEK(FA+3):POKE188,
      PEEK(FA+4):IFOP=0THEN92
      0
HJ 890 SYS 63466:IF(PEEK(783)A
      ND1)THEN GOSUB1060:PRIN
      T"{DOWN}{RVS} FILE NOT
      {SPACE}FOUND ":GOTO690
CS 900 AD=PEEK(829)+256*PEEK(8
      30):IF AD<>SA THEN F=1:
      GOTO970
SC 910 A=PEEK(831)+256*PEEK(83
      2)-1:F=F-2*(A<EA)-3*(A>
      EA):AD=A-AD:GOTO930
KM 920 A=SA:B=EA+1:GOSUB1010:P
      OKE780,3:SYS 63338
JF 930 A=BS:B=BS+(EA-SA)+1:GOS
      UB1010:ON OP GOTO950:SY
      S 63591
AE 940 GOSUB1080:PRINT"{BLU}**
       SAVE COMPLETED **":GOT
      O220
XP 950 POKE147,0:SYS 63562:IF
      {SPACE}ST>0 THEN970
FR 960 GOSUB1080:PRINT"{BLU}**
       LOAD COMPLETED **":GOT
      O220
DP 970 GOSUB1060:PRINT"{BLK}
      {RVS}ERROR DURING LOAD:
      {DOWN}[4]":ON F GOSUB98
      0,990,1000:GOTO220
PP 980 PRINT"INCORRECT STARTIN
      G ADDRESS (";:GOSUB360:
      PRINT")":RETURN
GR 990 PRINT"LOAD ENDED AT ";:
      AD=SA+AD:GOSUB360:PRINT
      D$:RETURN
FD 1000 PRINT"TRUNCATED AT END
      ING ADDRESS":RETURN
RX 1010 AH=INT(A/256):AL=A-(AH
      *256):POKE193,AL:POKE1
      94,AH
FF 1020 AH=INT(B/256):AL=B-(AH
      *256):POKE174,AL:POKE1
      75,AH:RETURN
FX 1030 IF AD<SA OR AD>EA THEN
      1050
HA 1040 IF(AD>511 AND AD<40960
```

Mon-Fri 9am-9pm CST
Sat 11am-5pm

SINCE1982
ComputAbility
Consumer Electronics

Mon-Fri 9am-9pm CST
Sat 11am-5pm

NEW **star micronics** NX-1000
- 144 CPS-Draft
- 30CPS-NLQ
- NLQ In 10 &12 Pitch
- 3 Built-In Fonts

ONLY $169

NEW **star micronics** NX-1000C RAINBOW
NEW LOW COST COLOR PRINTER

ONLY $239

commodore AMIGA 500
CALL FOR CURRENT PRICE

Panasonic Office Automation
1080 i - II
Now at 144 CPS
ONLY $179

Panasonic Office Automation
1091 i - II
Now at 192 CPS
ONLY $199

NEW **AVATEX 1200E**
1200 BAUD HAYES COMPATIBLE & RS 232 Interface
ONLY $109

FSD-2 DISK DRIVE
ONLY $159
FREE SHIPPING IN CONTINENTAL USA

1571 DISK DRIVE
1802C MONITOR
1084 MONITOR
64C COMPUTER
C-128D COMPUTER
1541C DISK DRIVE

commodore®

CALL FOR CURRENT PRICES & AVAILABILITY

1750 RAM EXPANDER
AVATEX 1200 HC MODEM
1764 RAM EXPANDER
AVATEX 2400 HC MODEM
1351 MOUSE
ICON TROLLER
1670 MODEM
XECTEC GOLD INTERFACE

C-128 SOFTWARE

Basic Compiler 128	39.95	Fleet System 4	46.95
Beyond Zork	29.95	Fontmaster 128	36.95
Bureaucracy	22.95	GeoCalc 128	42.95
Cad Pak 128	39.95	GeoFile 128	42.95
Chart Pak 128	25.95	Geos 128	42.95
Cobol 128	39.95	GeoWrite 128	42.95
Data Manager 128	32.95	Partner 128	32.95
Pocket Filer 2	36.95	Super Pak 128	46.95
Speed Term 128	25.95	Swiftcalc 128	32.95
Superbase 128	57.95	Sylvia Porter 128	42.95
Super C Compiler	39.95	Visastar 128	54.95
Superscript 128	46.95	Wordwriter 128	32.95
Super Pascal 128	39.95		
SuperPak 2	59.95		

AMIGA SOFTWARE
CALL FOR PRICE & AVAILABILITY

MISCELLANEOUS 64

$100,000 Pyramid	10.95
Animation Station	59.95
Art Gallery 1 or 2	16.95
Border Zone	22.95
Business Form Shop	25.95
Bumper Sticker Maker	31.95
Copy II 64	27.95
Create a BasketBall Team	17.95
Cycle Night	16.95
Dark Tower	19.95
Dark Castle	21.95
Final Cartridge 3	49.95
Flight Simulator II	27.95
Flexi Draw	CALL
Fontmaster 2	30.95
High Rollers	10.95
Hobit	23.95
Hollywood Hijinks	22.95
Hi Seas	32.95
Jet	27.95
Leather Goddesses	22.95
Lurking Horror	22.95
NBA	25.95
Night on the Town	19.95
Nord And Bert	22.95
Maniac Mansion	22.95
Micro League Baseball	25.95
Moonmist	22.95
Oxford Basic Tool Kit	19.95
Plundered Hearts	22.95
Pocket Dictionary	10.95
Pro FootBall Facts	31.95
Printmaster	21.95
Pure Stat Basketball	25.95
Pure Stat Football	25.95
Pure Stat Baseball	35.95
Raids on Raiders	22.95
Sentry	25.95
Star Empire	17.95
Starfleet I	26.95
Station Fall	22.95
Starglider	25.95
Star Trek 3/Rebel Universe	19.95
Sublogic Stealth Mission	33.95
Superscript 64	32.95
Superbase 64	46.95
SuperPak 2	59.95
Tetris	17.95
Three Stooges	22.95
Thunder Chopper	19.95
Typing Tutor 4	25.95
Up Periscope	19.95
Warp Speed	32.95
Winter Challenge	10.95
Wizardry	25.95
WWF Wrestling	19.95
X-15	19.95
Zig Zag	17.95
1942	19.95

ACTIVISION

Aliens	22.95
Champ Baseball '86	19.95
GFL Football	22.95
Greet. Card Maker	22.95
Hacker II	10.95
Last Ninja	22.95
Portal	25.95
Tass Times	19.95
Top Fuel Eliminator	19.95
Transformers	10.95
2 on 2 Basketball	22.95
Might & Magic	25.95
Gee Bee Air Rally	19.95
Postcards	17.95
Star Rank Boxing II	19.95
Rampage	22.95

ABACUS 64

Basic Compiler	25.95
Chartpak	25.95
Cad-Pak	25.95
Forth	25.95
Geos Inside & Out	16.95
Powerplan	25.95
Personal Portfolio	25.95
Super C Compiler	39.95
Super Pascal	39.95
Xper System	39.95

CAPCOM

Gunsmoke	19.95
Hat Trick	19.95
Mini-golf	19.95
SideArm	19.95
Speed Rumbler	19.95
Trojan	19.95

TIMEWORKS

Business Systems	34.95
Data Manager II	15.95
Desktop Publisher	39.95
Evelyn Wood	15.95
Geos Writer	25.95
Partner 64	25.95
Sideways	15.95
Swiftax' 86	32.95
Swiftcalc/Sideways	15.95
Sylvia Porter	25.95
Wordwriter 3	25.95

BRODERBUND

Arcade Construction Kit	19.95
Autoduel	31.95
Carmen SanDgo Wrld/Eur	22.95
Cauldron	19.95
Graphic Lib. 1,2 or 3	16.95
Magnetron	16.95
Moebius	25.95
Ogre	25.95
P.S. Companion	22.95
Print Shop	28.95
Super Bike Challenge	19.95
Thinking Cap	22.95
Toy Shop	19.95
Ultima 1	25.95
Ultima 3	25.95
Ultima 4	38.95
Ultima 5 (June)	38.95

MICROPROSE

Airbourne Ranger	22.95
Crusade In Europe	25.95
Conflict In Vietnam	25.95
Decision in the Desert	25.95
F-15 Strike Eagle	22.95
Gunship	22.95
Kennedy Approach	16.95
Pirates	25.95
Red Storm Rising	25.95
Silent Service	22.95
Stealth Fighter	25.95
Top Gunner	16.95

SSI

B-24	25.95
Battlecruiser	39.95
Eternal Dagger	25.95
Panzer Strike	29.95
Phantasie I,II,or III	25.95
President Elect '88	17.95
Questron II	25.95
Realms/Darkness	25.95
Rings of Zilfin	25.95
Roadwar 2000	25.95
Roadwar Europa	25.95
Shard of Spring	25.95
Shiloh	25.95
Sons of Liberty	22.95
War in S. Pacific	39.95
Wargame Construction	20.95
Wizard's Crown	25.95

SPRINGBOARD

Certificate Maker	14.95
Cert. Maker Lib 1	10.95
Clip Art 1, 2 or 3	10.95
Graphics Expander	21.95
Newsroom	14.95

EPYX

Apshai Trilogy	14.95
BoulderDash Constr Set	16.95
California Games	22.95
Champ Wrestling	14.95
Death Sword	16.95
Destroyer	22.95
Dive Bomber	18.95
Metro Cross	12.95
Fast Load	22.95
4x4 Off Road Racing	22.95
Home Video Producer	30.95
Impossible Mission II	22.95
L.A. Crack Down	22.95
Omnicron Conspiracy	22.95
RAD Warrior	16.95
Sticker Maker	21.95
Street Cat	12.95
St. Sports Basketball	22.95
St. Sports Baseball	22.95
Sub Battle Simulator	22.95
Super Cycle	14.95
Summer Games I or 2	14.95
Spy US Spy 3	16.95
The Games:Winter Edition	22.95
World Games	22.95
Winter Games	14.95

BERKLEY SOFTWORKS

Deskpak I	21.95
Font Pak I	18.95
Geocalc	31.95
Geo Triple Pak	31.95
Geodex	24.95
Geofile	31.95
Geo Programmer	42.95
Geopublish	42.95
Geos	36.95
Geospell	18.95
GeoWrite	31.95

MINDSCAPE

Bad Street Brawler	19.95
Block Buster 64	19.95
Bop 'N' Wrestle	19.95
Color Me	Call
Deeper Dungeons (4Gritt)	17.95
Defender of the Crown	22.95
Deja Vu	22.95
Harrier Comb. Simulator	19.95
Head Over Heals	10.95
Indoor Sports 1 or 2	19.95
Infiltrator 2	22.95
Into the Eagle's Nest	19.95
M.I.S.L. Soccer	22.95
Paper Boy	22.95
Roadrunner	19.95
S.D.I.	22.95
Superstar Ice Hockey	22.95
Superstar Soccer	22.95
Temple of Doom	22.95
The Gauntlet	22.95
Trailblazer	19.95
Wizball	16.95
Xevious	19.95
720	22.95

MICRO-ILLUSION

Black Jack Academy	25.95
Galactic Invasions	16.95
Fairy Tale Adv	32.95
Firepower	16.95
Lands of Legends	32.95
Planetarium	44.95
Romantic Encounter	25.95
Turbo	16.95

KONAMI

Contra	19.95
Iron Horse	19.95
Jail Break	19.95
Rushin Attack/Kung Fu	19.95
Super Basketball	19.95

ELECTRONIC ARTS

Adv. Construction	10.95
Alien Fires	20.95
Alternate Reality	20.95
American Civil War	26.95
America's Cup	10.95
Amnesia	26.95
Archon	10.95
Archon II	10.95
Arctic Fox	22.95
Bard's Tale	25.95
Battle Droidz	17.95
Battle Disk/Pegasus	11.95
Battlefront	25.95
Bismarck	21.95
Carriers At War	31.95
Chessmaster 2000	25.95
Chickamauga	23.95
Dan Dare	14.95
Dark Lord	14.95
Delta Patrol	14.95
Demon Stalkers	20.95
Dragon's Lair	19.95
EOS	20.95
Europe Ablaze	31.95
Financial Cookbook	10.95
Force 7	14.95
Global Commander	20.95
Halls of Montezuma	26.95
Heart of Africa	10.95
Hunt for Red October	26.95
Instant Music	24.95
Lords of Conquest	10.95
Master Ninja	20.95
Marble Madness	20.95
Mavis Beacon Typing	26.95
Monopoly	26.95
Mail Order Monsters	10.95
Mind Mirror	10.95
Mute	10.95
Murder Party	10.95
Music Construction	10.95
One on One	10.95
Outrageous Pages	33.95
Paper Clip III	33.95
Paper Clip Publisher	33.95
Patton vs Rommel	21.95
Pegasus	23.95
Pinball Construction	10.95
Racing Destruction	10.95
Reach for the Stars	30.95
Roadwars	20.95
Road to Moscow	25.95
Robot Rascals	25.95
Rockford	21.95
Rubicon Alliance	14.95
Russia	25.95
Scrabble	22.95
Scruples	26.95
Seven Cities of Gold	10.95
Skate or Die	21.95
Strike Fleet	21.95
Skyfox 2	21.95
Super Boulderdash	10.95
The Dungeon	26.95
Touchdown Football	10.95
Tobruk	23.95
Tomahawk	21.95
Twilight's Ransom	23.95
Ultimate Wizard	10.95
Video Title Shop	20.95
World Tour Golf	23.95
Yeager AFS	24.95

FIREBIRD

Elite	10.95
Pawn	10.95
Jewels of Darkness	11.95
Silicon Dreams	11.95
Druid	11.95
Cholo	11.95
Revs +	11.95
Heartland	11.95
Knight ORC	25.95
Guild of Thieves	25.95

ACCESS

Echelon	29.95
Famous Courses	14.95
Leader Board Tri-Pak	10.95
Mach V-Cart	21.95
Triple Pak	14.95
Wild Class Leader Brd	25.95
World Fam. Courses 1 or 2	14.95

DATA EAST

Breakthrough	22.95
Commando	22.95
Karate Champ	16.95
Kid Nikki	19.95
Kung Fu Master	16.95
Last Mission	9.95
Speed Buggy	19.95
Tag Team Wrestling	14.95
TNK 3	9.95
Ikari Warrior	19.95

ACCOLADE

Accolade Comics	18.95
Ace of Aces	18.95
Apollo 18	18.95
Bubble Ghost	CALL
Card Sharks	18.95
Hardball	18.95
Kill Until Dead	10.95
Mini Putt	18.95
Plasmatron	10.95
Power at Sea	18.95
Test Drive	18.95
The Train	18.95

COSMI

Chernobel	16.95
Grand Slam BB	16.95
Navcom 6	16.95
President is Missing	16.95
Shirley Muldoney	16.95

SINCE1982
ComputAbility
Consumer Electronics

P.O. BOX 17882, MILWAUKEE, WI 53217
ORDER LINES OPEN
Mon-Fri 9am-9pm CST Sat 11 am-5 pm CST
To Order Call Toll Free

800-558-0003

For Technical Info, Order Inquiries, or for Wisc.Orders
414-357-8181
Telex Number 910-262-6440 (Answerback-Comput Mfg. UD)

MasterCard VISA

No surcharge for Mastercard of Visa

ORDERING INFORMATION: Please specify system. For fast delivery send cashier's check or money order. Personal and company checks allow 14 business days to clear. School P.O.'s welcome. C.O.D. charges are $3.00. In Continental USA include $3.00 for software orders 5% shipping for hardware minimum $5.00. MasterCard and Visa orders please include card #, expiration date and signature. WI residents please include 5% sales tax. HI, AK, FPO, APO, Puerto Rico and Canadian orders, please add 6% shipping, Minimum $6.00. All other foreign orders add 15% shipping, minimum $15.00. All order shipped outside the Continental U.S.A are shipped first class insured U.S. mail. If foreign shipping charges exceed the minimum amount, you will be charged the additional amount to get your package to you quickly and safely. All goods are new and include factory warranty. Due to our low prices all sales are final. All defective returns must have a return authorization number. Please call (414)357-8181 to obtain an RA# or your return will not be accepted Prices and availability subject to change without notice.

```
        )OR(AD>49151 AND AD<53
        248)THEN GOSUB1080:F=0
        :RETURN
HC 1050 GOSUB1060:PRINT"{RVS}
        {SPACE}INVALID ADDRESS
         {DOWN}{BLK}":F=1:RETU
        RN
AR 1060 POKE SD+5,31:POKE SD+6
        ,208:POKE SD,240:POKE
        {SPACE}SD+1,4:POKE SD+
        4,33
DX 1070 FOR S=1 TO 100:NEXT:GO
        TO1090
PF 1080 POKE SD+5,8:POKE SD+6,
        240:POKE SD,0:POKE SD+
        1,90:POKE SD+4,17
AC 1090 FOR S=1 TO 100:NEXT:PO
        KE SD+4,0:POKE SD,0:PO
        KE SD+1,0:RETURN
```

Program 2: MLX For Commodore 128

```
AE 100 TRAP 960:POKE 4627,128:
       DIM NL$,A(7)
XP 110 Z2=2:Z4=254:Z5=255:Z6=2
       56:Z7=127:BS=256*PEEK(4
       627):EA=65280
FB 120 BE$=CHR$(7):RT$=CHR$(13
       ):DL$=CHR$(20):SP$=CHR$
       (32):LF$=CHR$(157)
KE 130 DEF FNHB(A)=INT(A/256):
       DEF FNLB(A)=A-FNHB(A)*2
       56:DEF FNAD(A)=PEEK(A)+
       256*PEEK(A+1)
JB 140 KEY 1,"A":KEY 3,"B":KEY
        5,"C":KEY 7,"D":VOL 15
       :IF RGR(0)=5 THEN FAST
FJ 150 PRINT"{CLR}"CHR$(142);C
       HR$(8):COLOR 0,15:COLOR
        4,15:COLOR 6,15
GQ 160 PRINT TAB(12)"{RED}
       {RVS}{2 SPACES}[9 @]
       {2 SPACES}"RT$;TAB(12)"
       {RVS}{2 SPACES}{OFF}
       {BLU} 128 MLX {RED}
       {RVS}{2 SPACES}"RT$;TAB
       (12)"{RVS}{13 SPACES}
       {BLU}"
FE 170 PRINT"{2 DOWN}
       {3 SPACES}COMPUTE!'S MA
       CHINE LANGUAGE EDITOR
       {2 DOWN}"
DK 180 PRINT"{BLK}STARTING ADD
       RESS[4]";:GOSUB 260:IF
       {SPACE}AD THEN SA=AD:EL
       SE 180
FH 190 PRINT"{BLK}{2 SPACES}EN
       DING ADDRESS[4]";:GOSUB
        260:IF AD THEN EA=AD:E
       LSE 190
MF 200 PRINT"{DOWN}{BLK}CLEAR
       {SPACE}WORKSPACE [Y/N]?
       [4]":GETKEY A$:IF A$<>"
       Y" THEN 220
QH 210 PRINT"{DOWN}{BLU}WORKIN
       G...";:BANK 0:FOR A=BS
       {SPACE}TO BS+(EA-SA)+7:
       POKE A,0:NEXT A:PRINT"D
       ONE"
DC 220 PRINT TAB(10)"{DOWN}
       {BLK}{RVS} MLX COMMAND
       {SPACE}MENU [4]{DOWN}":
       PRINT TAB(13)"{RVS}E
       {OFF}NTER DATA"RT$;TAB(
       13)"{RVS}D{OFF}ISPLAY D
       ATA"RT$;TAB(13)"{RVS}L
       {OFF}OAD FILE"
HB 230 PRINT TAB(13)"{RVS}S
       {OFF}AVE FILE"RT$;TAB(1
       3)"{RVS}C{OFF}ATALOG DI
       SK"RT$;TAB(13)"{RVS}Q
       {OFF}UIT{DOWN}{BLK}"
AP 240 GETKEY A$:A=INSTR("EDLS
       CQ",A$):ON A GOTO 340,5
       50,640,650,930,940:GOSU
       B 950:GOTO 240
SX 250 PRINT"STARTING AT";:GOS
       UB 260:IF(AD<>0)OR(A$=N
       L$)THEN RETURN:ELSE 250
BG 260 A$=NL$:INPUT A$:IF LEN(
       A$)=4 THEN AD=DEC(A$)
PP 270 IF AD=0 THEN BEGIN:IF A
       $<>NL$ THEN 300:ELSE RE
       TURN:BEND
MA 280 IF AD<SA OR AD>EA THEN
       {SPACE}300
PM 290 IF AD>511 AND AD<65280
       {SPACE}THEN PRINT BE$;:
       RETURN
SQ 300 GOSUB 950:PRINT"{RVS} I
       NVALID ADDRESS {DOWN}
       {BLK}":AD=0:RETURN
RD 310 CK=FNHB(AD):CK=AD-Z4*CK
       +Z5*(CK>Z7):GOTO 330
DD 320 CK=CK*Z2+Z5*(CK>Z7)+A
AH 330 CK=CK+Z5*(CK>Z5):RETURN
QD 340 PRINT BE$;"{RVS} ENTER
       {SPACE}DATA ":GOSUB 250
       :IF A$=NL$ THEN 220
JA 350 BANK 0:PRINT:F=0:OPEN 3
       ,3
BR 360 GOSUB 310:PRINT HEX$(AD
       )+":";:IF F THEN PRINT
       {SPACE}L$:PRINT"{UP}
       {5 RIGHT}";
QA 370 FOR I=0 TO 24 STEP 3:B$
       =SP$:FOR J=1 TO 2:IF F
       {SPACE}THEN B$=MID$(L$,
       I+J,1)
PS 380 PRINT"{RVS}"B$+LF$;:IF
       {SPACE}I<24 THEN PRINT"
       {OFF}";
RC 390 GETKEY A$:IF (A$>"/" AN
       D A$<":") OR(A$>"@" AND
        A$<"G") THEN 470
AC 400 IF A$="+" THEN A$="E":G
       OTO 470
QB 410 IF A$="-" THEN A$="F":G
       OTO 470
FB 420 IF A$=RT$ AND ((I=0) AN
       D (J=1) OR F) THEN PRIN
       T B$;:J=2:NEXT:I=24:GOT
       O 480
RD 430 IF A$="{HOME}" THEN PRI
       NT B$:J=2:NEXT:I=24:NEX
       T:F=0:GOTO 360
XB 440 IF (A$="{RIGHT}") AND F
        THEN PRINT B$+LF$;:GOT
       O 470
JP 450 IF A$<>LF$ AND A$<>DL$
       {SPACE}OR ((I=0) AND (J
       =1)) THEN GOSUB 950:GOT
       O 390
PS 460 A$=LF$+SP$+LF$:PRINT B$
       +LF$;:J=2-J:IF J THEN P
       RINT LF$;:I=I-3
GB 470 PRINT A$;:NEXT J:PRINT
       {SPACE}SP$;
HA 480 NEXT I:PRINT:PRINT"{UP}
       {5 RIGHT}";:L$="
       {27 SPACES}"
DP 490 FOR I=1 TO 25 STEP 3:GE
       T#3,A$,B$:IF A$=SP$ THE
       N I=25:NEXT:CLOSE 3:GOT
       O 220
BA 500 A$=A$+B$:A=DEC(A$):MID$
       (L$,I,2)=A$:IF I<25 THE
       N GOSUB 320:A(I/3)=A:GE
       T#3,A$
AR 510 NEXT I:IF A<>CK THEN GO
       SUB 950:PRINT:PRINT"
       {RVS} ERROR: REENTER LI
       NE ":F=1:GOTO 360
DX 520 PRINT BE$:B=BS+AD-SA:FO
       R I=0 TO 7:POKE B+I,A(I
       ):NEXT I
XB 530 F=0:AD=AD+8:IF AD<=EA T
       HEN 360
CA 540 CLOSE 3:PRINT"{DOWN}
       {BLU}** END OF ENTRY **
       {BLK}{2 DOWN}":GOTO 650
MC 550 PRINT BE$;"{CLR}{DOWN}
       {RVS} DISPLAY DATA ":GO
       SUB 250:IF A$=NL$ THEN
       {SPACE}220
JF 560 BANK 0:PRINT"{DOWN}
       {BLU}PRESS: {RVS}SPACE
       {OFF} TO PAUSE, {RVS}RE
       TURN{OFF} TO BREAK[4]
       {DOWN}"
XA 570 PRINT HEX$(AD)+":";:GOS
       UB 310:B=BS+AD-SA
DJ 580 FOR I=B TO B+7:A=PEEK(I
       ):PRINT RIGHT$(HEX$(A),
       2);SP$;:GOSUB 320:NEXT
       {SPACE}I
XB 590 PRINT"{RVS}";RIGHT$(HEX
       $(CK),2)
GR 600 F=1:AD=AD+8:IF AD>EA TH
       EN PRINT"{BLU}** END OF
        DATA **":GOTO 220
EB 610 GET A$:IF A$=RT$ THEN P
       RINT BE$:GOTO 220
QK 620 IF A$=SP$ THEN F=F+1:PR
       INT BE$;
XS 630 ON F GOTO 570,610,570
RF 640 PRINT BE$"{DOWN}{RVS} L
       OAD DATA ":OP=1:GOTO 66
       0
BP 650 PRINT BE$"{DOWN}{RVS} S
       AVE FILE ":OP=0
DM 660 F=0:F$=NL$:INPUT"FILENA
       ME[4]";F$:IF F$=NL$ THE
       N 220
RF 670 PRINT"{DOWN}{BLK}{RVS}T
       {OFF}APE OR {RVS}D{OFF}
       ISK: [4]";
SQ 680 GETKEY A$:IF A$="T" THE
       N 850:ELSE IF A$<>"D" T
       HEN 680
SP 690 PRINT"DISK{DOWN}":IF OP
        THEN 760
EG 700 DOPEN#1,(F$+",P"),W:IF
       {SPACE}DS THEN A$=DS$:G
       OTO 740
JH 710 BANK 0:POKE BS-2,FNLB(S
       A):POKE BS-1,FNHB(SA):P
       RINT"SAVING ";F$:PRINT
MC 720 FOR A=BS-2 TO BS+EA-SA:
       PRINT#1,CHR$(PEEK(A));:
       IF ST THEN A$="DISK WRI
       TE ERROR":GOTO 750
GC 730 NEXT A:CLOSE 1:PRINT"
       {BLU}** SAVE COMPLETED
       {SPACE}WITHOUT ERRORS *
       *":GOTO 220
RA 740 IF DS=63 THEN BEGIN:CLO
       SE 1:INPUT"{BLK}REPLACE
        EXISTING FILE [Y/N][4]
       ";A$:IF A$="Y" THEN SCR
       ATCH(F$):PRINT:GOTO 700
       :ELSE PRINT"{BLK}":GOTO
        660:BEND
GA 750 CLOSE 1:GOSUB 950:PRINT
       "{BLK}{RVS} ERROR DURIN
       G SAVE: [4]":PRINT A$:G
       OTO 220
FD 760 DOPEN#1,(F$+",P"):IF DS
        THEN A$=DS$:F=4:CLOSE
       {SPACE}1:GOTO 790
```

Tevex Computer Software
1-800-456-1162

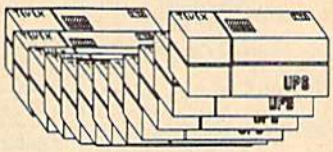
C-64/128 software	List $	Our $	C-64/128 software	List $	Our $
Adventure Constr.	$15	$12	Might & Magic	$40	$28
Airborne Ranger	$35	$24	NBA	$40	$28
Aliens	$35	$24	Paperboy	$35	$24
Auto Duel	$50	$34	Phantasie III	$40	$28
B-24	$35	$24	Pirates	$40	$28
Bard's Tale I or II	$40	$28	*Questron II*	$40	$28
Beyond Zork	$45	$31	Realms of Darkness	$40	$28
California Games	$40	$28	Russia	$40	$28
Chuck Yeager AFT	$35	$24	Shiloh	$40	$28
Civil War	$40	$28	Skate or Die	$30	$21
Defender - Crown	$35	$24	Starfleet I	$40	$28
Dragon's Lair	$25	$18	Stealth Fighter	$40	$28
Echelon	$45	$31	*Strike Fleet*	$30	$21
Games: Winter ed	$40	$28	Test Drive	$30	$21
Gauntlet	$35	$24	Wargame Constr.	$30	$21
Gunship	$35	$24	*Wizardry I*	$40	$28
Last Ninja	$35	$24	*Wooden Ships*	$35	$24
Legacy Ancients	$30	$21	WC Leader Board	$40	$28
Maniac Mansion	$35	$24	Wrestlemania	$30	$21

Same Day Shipping

Just call us before 3:30 and we'll ship your order *today* by UPS. Your package is only days away with Tevex.

Free 40 page catalog with your first order. We stock hundreds of C-64/128 games.

When ordering by mail send money order. Include phone number. SHIPPING: U.S. orders add $3.00 for shipping and handling charge. Georgia residents add 4% sales tax.



TEVEX
4205 First Ave #100
Tucker, GA 30084
404-934-5059
Established in 1984

We accept Visa or Mastercard

Convert your C64/C128 to a real synthesizer with the

SFX SOUND EXPANDER

SFX SOUND EXPANDER **$180.00**
A nine voice programmable synthesizer module using FM technology to generate professional quality sounds. Includes basic software and audio connector cable. MIDI compatible with suitable interface.

SFX FULL SIZED KEYBOARD **$145.50**
A five octave synthesizer style key board which plugs into the Sound Expander module

SFX FM COMPOSER AND SOUND EDITOR **$ 45.50**
The software to get the most out of the SFX Sound Expander! Nine channel sequencer and voice editor programs allow you to write, alter, store and playback music and to create custom sounds which you can store for use in your music.

SFX SOUND SAMPLER

SFX SOUND SAMPLER **$127.00**
Record sounds digitally and play them back higher or lower in pitch, edit them, display the waveform, work with up to four samples at once, use as a real time echo or pitch shifter.

FEARN & MUSIC
519 W. Taylor #114, Santa Maria, CA 93454
Phone 805-925-6682
1-800-447-3434
(DEALER INQUIRIES INVITED)

VISA MasterCard

FOR MAIL ORDERS ONLY! CALL TOLL FREE 1-800-234-5888

COMPUTER WORLD

ASTORIA
40-17 Broadway-East Of Steinway St. Corner
FOR INFO: 718-726-8118
MON.-FRI. 10:30-7/CLOSED SAT./SUN. 11-6

BROOKLYN
8304 5th Avenue
Bet. 83rd & 84th St.
FOR INFO: 718-748-0936
MON.-FRI. 10:30-7/CLOSED SAT./SUN. 11-6

COMMODORE 64C — 10 FREE DISKS

COMPLETE PACKAGE
- C64C Computer
- 1541 Disk Drive
- 80 Col. Printer
- 12" Computer Monitor
- GEOS And Quantum Link Software
- Game Cartridge

$349

COMMODORE 128 PERSONAL COMPUTER

To Substitute 1571 For 1541 Add $55.00

COMPLETE PACKAGE
- C128 Computer
- 12" Computer Monitor
- 1541 Disk Drive
- 80 Col. Printer
- Game Cartridge

COLOR MONITOR ADD $80 — 10 FREE DISKS

$449

COMMODORE 128 PERSONAL COMPUTER — 10 FREE DISKS

- C128 Computer
- Commodore 1571 Disk Drive
- Commodore 1902 RGB Color Monitor
- 80 Column Printer
- Game Cartridge

$669

COMMODORE 64C — 10 FREE DISKS

COLOR PACKAGE
- Commodore 64C Computer
- Commodore 1541C Disk Drive
- 80 Col. Printer
- Color Monitor
- With GEOS Program & Quantum Link
- Game Cartridge

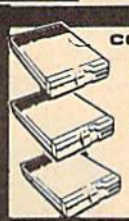
$499

LARGE SELECTION OF PRINTERS IN STOCK!

commodore 64C With GEOS Program **CALL!**

commodore 128 **$218**

commodore



1541C Disk Drive **$148**
1571 Disk Drive **$208**
1581 Disk Drive **$188**

NEW!
Commodore AMIGA 500

- 68000 Processor
- 512K Ram Expandable To 9 MB
- Graphics Processor

IN STOCK CALL!

AMIGA PERIPHERALS
A-501 512K Expansion
A-1010 3.5" Floppy Drive
A-1020T 5.25" Disk Drive With Transformer RF Modulator
A-1084 RGB Color Monitor
A-1300 Genlock
1680 Modem
A-2088D Bridge Card

GO 64 For Amiga 500, 1000, 2000, Use Your 64 & 128 Software On Your Amiga $69.95

AMIGA 2000 IN STOCK! CALL

FULL LINE OF COMMODORE SOFTWARE!

ALL COMPUTERS & PERIPHERALS COMPLETE WITH AC ADAPTOR, OWNERS MANUAL & ALL CONNECTING CABLES.

ALL MERCHANDISE IS BRAND NEW & DIRECT FROM FACTORY. ALL COMPLETE WITH MFG. U.S.A. WARRANTY.

COMMODORE

Commodore MPS-1000	$165
Commodore MPS-1200	$208
STAR	
Star NX-1000	$168
Star NX-10	$159
Star NX-10C	$169
OKIDATA	
Okidata 120	$189
Okidata 20 W/Plug n' Print	$185
EPSON	
LX-86 Printer	$195
FX-286E Printer	$445

commodore

1902 RGB Color Monitor **$209**
1802 Color Monitor **$165**
1084 Color RGB Monitor **$259**
Thompson RGB Color Monitor **$269**

BLUE CHIP

IBM PC/XT COMPATIBLE PACKAGE **$649**

- Blue Chip Keyboard
- 512K Expandable To 640K
- 6 Expansion Slots Optional 20 MB Hard Drive
- All Hook-Up Cables & Adaptors
- Package Of 10 Diskettes
- 12" Monitor

IBM TURBO

IBM PC/XT COMPATIBLE **$599**

- 640K
- 2 Drive 360K
- 8088/2 CPU
- 4.77 10 MHZ
- 12" High Resolution Monitor
- MS DOS 3.2
- 2/360 Drives

• SERVICE CENTER FOR COMMODORE •
• ATARI COMPUTERS AT LOW PRICES •

Certified check, bank check, Mastercard, Visa, American Express, Diner's Club, Carte Blanche, Discover Card and C.O.D.'s accepted. No additional surcharge for credit card orders. Non-certified checks must wait 4-6 weeks clearance. Money orders are non-certified checks. N.Y. residents add applicable sales tax. Prices and availability subject to change without notice. Not responsible for typographic errors. Return defective merchandise must have prior return authorization number, or returns will not be accepted. IBM PC/XT are registered trademarks of International Business Machine Corp. All orders can be shipped Air Express call for details. Pictures are illustrative only and may not be exact.

```
PX 770 GET#1,A$,B$:CLOSE 1:AD=
       ASC(A$)+256*ASC(B$):IF
       {SPACE}AD<>SA THEN F=1:
       GOTO 790
KB 780 PRINT"LOADING ";F$:PRIN
       T:BLOAD(F$),B0,P(BS):AD
       =SA+FNAD(174)-BS-1:F=-2
       *(AD<EA)-3*(AD>EA)
RQ 790 IF F THEN 800:ELSE PRIN
       T"{BLU}** LOAD COMPLETE
       D WITHOUT ERRORS **":GO
       TO 220
ER 800 GOSUB 950:PRINT"{BLK}
       {RVS} ERROR DURING LOAD
       : [£4]":ON F GOSUB 810,8
       20,830,840:GOTO220
QJ 810 PRINT"INCORRECT STARTIN
       G ADDRESS (";HEX$(AD);"
       )":RETURN
DP 820 PRINT"LOAD ENDED AT ";H
       EX$(AD):RETURN
EB 830 PRINT"TRUNCATED AT ENDI
       NG ADDRESS ("HEX$(EA)")
       ":RETURN
FP 840 PRINT"DISK ERROR ";A$:R
       ETURN
KS 850 PRINT"TAPE":AD=POINTER(
       F$):BANK 1:A=PEEK(AD):A
       L=PEEK(AD+1):AH=PEEK(AD
       +2)
XX 860 BANK 15:SYS DEC("FF68")
       ,0,1:SYS DEC("FFBA"),1,
       1,0:SYS DEC("FFBD"),A,A
       L,AH:SYS DEC("FF90"),12
       8:IF OP THEN 890
FG 870 PRINT:A=SA:B=EA+1:GOSUB
        920:SYS DEC("E919"),3:
       PRINT"SAVING ";F$
AB 880 A=BS:B=BS+(EA-SA)+1:GOS
       UB 920:SYS DEC("EA18"):
       PRINT"{DOWN}{BLU}** TAP
       E SAVE COMPLETED **":GO
       TO 220
CP 890 SYS DEC("E99A"):PRINT:I
       F PEEK(2816)=5 THEN GOS
       UB 950:PRINT"{DOWN}
       {BLK}{RVS} FILE NOT FOU
       ND ":GOTO 220
GQ 900 PRINT"LOADING ...{DOWN}
       ":AD=FNAD(2817):IF AD<>
       SA THEN F=1:GOTO 800:EL
       SE AD=FNAD(2819)-1:F=-2
       *(AD<EA)-3*(AD>EA)
JD 910 A=BS:B=BS+(EA-SA)+1:GOS
       UB 920:SYS DEC("E9FB"):
       IF ST>0 THEN 800:ELSE 7
       90
XB 920 POKE193,FNLB(A):POKE194
       ,FNHB(A):POKE 174,FNLB(
       B):POKE 175,FNHB(B):RET
       URN
CP 930 CATALOG:PRINT"{DOWN}
       {BLU}** PRESS ANY KEY F
       OR MENU **":GETKEY A$:G
       OTO 220
MM 940 PRINT BE$"{RVS} QUIT
       [£4]";RT$;"ARE YOU SURE
       {SPACE}[Y/N]?":GETKEY A
       $:IF A$<>"Y" THEN 220:E
       LSE PRINT"{CLR}":BANK 1
       5:END
JE 950 SOUND 1,500,10:RETURN
AF 960 IF ER=14 AND EL=260 THE
       N RESUME 300
MK 970 IF ER=14 AND EL=500 THE
       N RESUME NEXT
KJ 980 IF ER=4 AND EL=780 THEN
        F=4:A$=DS$:RESUME 800
DQ 990 IF ER=30 THEN RESUME:EL
       SE PRINT ERR$(ER);" ERR
       OR IN LINE";EL
```


GREENSBORO COMPUTER CENTER

AN AUTHORIZED COMMODORE REPAIR CENTER

72-HOUR TURNAROUND FOR MOST COMPUTERS

C64	$55.00
C128	$87.50
1541	$65.00
1541 and 1571	$27.95 Perm-alignment only
1571	$75.00
A1000	$45.00 hr. (plus parts)
CBM PRINTERS	$45.00 hr. (plus parts)

FOR OTHER PRICING CALL!

Please enclose $7.50 for return shipping.

All repairs come with a 30-day warranty and we guarantee the entire keyboard to work properly not just the repaired section. **POWER SUPPLIES ARE NOT INCLUDED IN THE ABOVE PRICING AND ARE PURCHASED SEPARATELY.**

If you have any questions about our services, please call me at 919-855-5792. Thank you.

1109 S. Chapman St.
Greensboro, NC 27403

COLOR RIBBONS & PAPER

COLOR RIBBONS — RED, BROWN, BLUE, PURPLE, GREEN, YELLOW,

Ribbons	Price Each	Black	Color	Heat Transfer
Apple Imagewriter I/II		3.75	4.50	6.50
Citizen 120 D		5.00	6.00	7.95
Commodore MPS 801		4.15	4.75	5.75
Commodore MPS 802		6.00	6.75	–
Commodore MPS 803		4.95	5.95	7.00
Commodore MPS 1000		3.95	4.95	6.75
Commodore MPS 1200		5.00	6.00	7.95
Commodore 1525		6.00	–	–
Okidata 82/92/93		1.75	2.25	4.50
Okidata 182/192		6.50	7.50	–
Panasonic KX-P 1090		6.75	7.75	–
Seikosha SP 800/1000		5.25	6.50	7.95
Star SG 10		1.75	2.25	4.50
Star NX10/NL10		5.00	6.00	7.95

COLOR PAPER

BRIGHT PACK – 200 Sheets/50 each color: Red, Blue, Green, Yellow. 9 1/2 x 11 – $10.90/pk.

PASTEL PACK – 200 Sheets/50 each color: Pink, Yellow, Blue, Ivory. 9 1/2 x 11 – $10.90/pk.

T-SHIRT RIBBONS (Heat Transfer) – Call For Price.

COLOR DISKETTES

5 1/4" DS/DD Rainbow Pack. 10/pack – $12.50

For ribbons & paper not listed above, call for price & avail. Price & spec. subject to change w/o notice. Min. order $25.00. Min. S & H $3.50. Add $2.25 C.O.D. add'l. IL res. add 6.25% tax. MC & Visa accepted.

RENCO COMPUTER PRINTER SUPPLIES

P.O. Box 475, Manteno, IL 60950 U.S.A.
1-800-522-6922 • (IL) 1-800-356-9981
815-468-8081

COMMODORE SPECIAL

MW-350 PRINTER INTERFACE
2K BUFFER $49.95
10K BUFFER $59.95
SPECIAL 8K BUFFER UPGRADE
$8..95
ROM UPGRADE FOR OLDER
MW-350 1.9 ROM
$6.50

CBM 64/128

C64C	$169.00
C1541C	$175.00
1581 3.5 DRIVE	$CALL
1351 MOUSE	$35.00
C1660 MODEM	$35.00
C1670 MODEM	$SAVE
1764 RAM	$115.00
1802C MONITOR	$189.95
C128	$CALL
C128D	$435.00
1571 DISK	$215.00
1700 RAM "128K"	$105.00
1750 RAM "512K"	$CALL

CBM 64 POWER SUPPLIES

REPAIRABLE $39.95
NON-REPAIRABLE $2.9.95

MW- 401 40/80 COLUMN CABLE FOR THE CBM128 $29.95

MW-232 RS 232 INTERFACE FOR 64/128 $29.95

MW-611 UNIVERSAL I/O BOARD FOR THE C64/C128

16 ANALOG INPUTS
16 DISCRETE OUTPUTS
1 ANALOG OUTPUT
1 EPROM SOCKET
PROTOTYPING AREA

64 SOFTWARE

CHAMPIONSHIP BASEBALL	$14..95
ALIENS	$14.95
GHOSTBUSTERS	$14.95
ROAD RACE	$14.95
ELECTON. ARTS	CALL
ALL OTHERS	CALL

AMIGA

AMIGA 2000	CALL
BRIDGE BOARD	CALL
MEMORY	CALL
EXTRA DRIVES	CALL
MONITOR	CALL
AMIGA 500	CALL
MONITOR	CALL

MICRO WORLD ELECTRONIX SALES 1-800-288-8088
SUPPORT 303-988-5907 ALL PRICES SUBJECT TO CHANGE

AUTHORIZED ATARI ST/XL/XE

BUY, SELL OR TRADE!!!

COMMODORE/AMIGA DEALERS

All Hardware/Software & Accessories

Plus IBM Compatibles & Equipment

BRAND NEW AMIGA 500 Only $299 or NEW C128D w/built in drive $179 with trade-in of 64C Computer, 1541C Drive, 1902 Monitor, 1200 Modem.

BRAND NEW AMIGA 2000 Only $1099 with trade-in of C128 Computer, 1571 Drive, 1902 Monitor, MPS 1200 Printer. Add $439 for 2MB RAM Expander.

BRAND NEW C1541-II DRIVE or NEW C1581 3-1/2" DRIVE $129 with trade-in of 1541 Disk Drive.

USED C128 & NEW RGB 80 COLUMN MONITOR ONLY $445
Add $189 for new C1581 Disk Drive.

NEW PRODUCT PRICES

		— 64C/C128 —			
64C CPU w/GEOS	$189	1351 Mouse	$39	1764 256K RAM C64	$129
128D w/built-in drive	$479	1700 128k RAM C128	$109	1750 512k RAM C128	$159
C1084 RGB 80	$299	C1802C 40/80 Color	$189	RGB 40/80 column	$249
1581 3-1/2" Drive	$189	1541-II Drive	$189	FSD-2 Drive 100% 1541	$159
Star NX-1000, 144cps	$199	Micro R/D Interface	$49	Micro 256K Interface	$109
Xetec JR Interface	$39	Xetec SR Interface	$59	Xetec GOLD Interface	$119
Epyx 500XJ Joystick	$19	Wico Black Max	$10	Drive/etc cable	$12
		— MODEMS —			
Avatex 1200hc	$99	SmartLink 2400hc	$199	Aprotek RS232 Interfce	$36
Pract. Per. 2400hc	$199	Avatex 1200e	$89	Avatex 2400hc	$199
		— POWER SUPPLIES —			
C64 replacement power supply		$29	C128 replacement		$75
Amiga 500+ repairable replacement only $99					

USED PRODUCT PRICES

C64 CPU	$109	C128 CPU	$199	VIC20 CPU	$39
1541 Drive	$119	1571 Drive	$189	Vicmodem 64/128	$25
Hayes Smartmodem	$49	Digitizer/Recognition	$59	C1802 Monitor	$149
Monitors from	$49	MPS 801 Printer	$72	VIC 1525 Printer	$79
Okimate 10 color w/PIP	$109	Gemini 10 Printer	$119	Commodore 1530/C2N	$20
Datamaster Cassette	$16	DSI PPI Interface	$32	Xetec Graphix SR	$49

Hundreds of software & book titles for VIC-20, C64, C128 from $1.00. Call our computer with your 300/1200 baud modem 24 hours a day for software quotes. (303) 939-8174.

IBM COMPATIBLES

IBM XT COMPATIBLE — Color (CGA)/Mono graphics card, 4.77/10 MHz Turbo 8088, Phoenix BIOS. More than 2x as fast as the IBM XT. 640K RAM, 360K Drive. Printer/Modem/Game ports. Clock/Calendar. **Only $659***

IBM AT COMPATIBLE — HEGA/EGA/CGA/Mono graphics card, 8/12 MHz Turbo 80286, Phoenix BIOS. 15x as fast as the IBM XT. 512K RAM O-wait, 1.2 MB drive. Printer/Modem ports. Clock/Calendar. **Only $1249***

*Options: Monochrome monitor **$99**, CGA color monitor **$249**, EGA color monitor **$439**. Hard drives: Miniscribe 30MB w/XT cont **$369**, 20MB w/XT cont **$349** installed.

We pay cash for new, used and damaged equipment and accessories! CALL for an instant price quote on your equipment. Quantities of USED products vary. Please call before ordering. All used products are guaranteed to be in good working condition. Prices are subject to change without notice.

2017 13th Street, Suite A
Boulder, CO 80302

Computer Repeats, Inc.

Orders/Questions: (303) 939-8144
Modem software quotes: (303) 939-8174

We Accept Master Card/VISA/American Express and C.O.D.

We want to trade for YOUR EQUIPMENT! If your equipment is not mentioned, give us a call. All references to trade-ins assume equipment to be in good working condition. Shipping/handling is based on actual weight of order and will be added to all prices. Item compatibility is not guaranteed.

Prices shown reflect a 4% discount for cash. Add 4% for credit card purchases. Prices shown are mail order prices only.

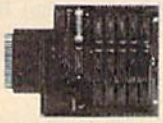
WE CHECK FOR STOLEN CREDIT CARDS

Authorized Dealers for COMMODORE/AMIGA and ATARI ST/XL/XE Computers and Accessories.

UNLEASH THE DATA ACQUISITION AND CONTROL POWER OF YOUR COMMODORE C64 OR C128.

***We have the answers* to all your control needs.**

NEW! 80-LINE SIMPLIFIED DIGITAL I/O BOARD



Create your own autostart dedicated controller without relying on disk drive.

- Socket for standard ROM cartridge.
- 40 separate buffered digital output lines can each directly switch 50 volts at 500 mA.
- 40 separate digital input lines. (TTL).
- I/O lines controlled through simple memory mapped ports each accessed via a single statement in Basic. No interface could be easier to use. A total of ten 8-bit ports.
- Included M.L. driver program optionally called as a subroutine for fast convenient access to individual I/O lines from Basic.
- Plugs into computer's expansion port. For both C64 & C128. I/O connections are through a pair of 50-pin professional type strip headers.
- Order Model SS100 Plus. **Only $119!** Shipping paid USA. Includes extensive documentation and program disk. Each additional board $109.

We take pride in our interface board documentation and software support, which is available separately for examination. Credit against first order.
SS100 Plus, $20. 64IF22 & ADC0816, $30.

OUR ORIGINAL ULTIMATE INTERFACE

- Universally applicable dual 6522 Versatile Interface Adapter (VIA) board.
- Industrial control and monitoring. Great for laboratory data acquisition and instrumentation applications.
- Intelligently control almost any device.
- Perform automated testing.
- Easy to program yet extremely powerful.
- Easily interfaced to high-perfomance A/D and D/A converters.
- Four 8-bit fully bidirectional I/O ports & eight handshake lines. Four 16-bit timer/counters. Full IRQ interrupt capability. Expandable to four boards.

Order Model 64IF22. $169 postpaid USA. Includes extensive documentation and programs on disk. Each additional board $149. Quantity pricing available. For both C64 and C128.

A/D CONVERSION MODULE

Fast. 16-channel. 8-bit. Requires above. Leaves all VIA ports available. For both C64 and C128. Order Model 64IF/ADC0816. Only $69.

SERIOUS ABOUT PROGRAMMING?

SYMBOL MASTER MULTI-PASS SYMBOLIC DISASSEMBLER. Learn to program like the experts! Adapt existing programs to your needs! Disassembles any 6502/6510/undoc/65C02/8502 machine code program into beautiful source. Outputs source code files to disk fully compatible with your MAE, PAL, CBM, Develop-64, LADS, Merlin or Panther assembler, ready for re-assembly and editing. Includes both C64 & C128 native mode versions. 100% machine code and extremely fast. 63-page manual. The original and best is now even better with Version 2.1! Advanced and sophisticated features far too numerous to detail here. $49.95 postpaid USA.

C64 SOURCE CODE. Most complete available reconstructed, extensively commented and cross-referenced assembly language source code for Basic and Kernal ROMs, all 16K. In book form, 242 pages. $29.95 postpaid USA.

PTD-6510 SYMBOLIC DEBUGGER for C64. An extremely powerful tool with capabilities far beyond a machine-language monitor. 100-page manual. Essential for assembly-language programmers. $49.95 postpaid USA.

MAE64 version 5.0. Fully professional 6502/65C02 macro editor/assembler. 80-page manual. $29.95 postpaid USA.

NEW ADDRESS!

SCHNEDLER SYSTEMS
Dept. G6, 25 Eastwood Road, P.O. Box 5964
Asheville, North Carolina 28813 Telephone (704) 274-4646

NEW ADDRESS!

FACTORY AUTHORIZED

COMMODORE REPAIR CENTER

1-800-772-7289

(312) 879-2888 IL

C64 Repair (PCB ONLY)	42.95	Amiga Repair (PCB ONLY)	99.95
C128 Repair (PCB ONLY)	64.95	Amiga Drive Repair	149.95
1541 Permanent Alignment	29.95	Printers	CALL
1541 Repair	79.95	Monitors	CALL
1571 Repair	79.95	Other Equipment	CALL

CALL BEFORE SHIPPING
PARTS AND LABOR INCLUDED
FREE RETURN SHIPPING
(APO, FPO, AIR ADD $10.00)
24-48 HR. TURNAROUND
(Subject to Parts Availability)
30 DAY WARRANTY ON ALL REPAIRS

COMMODORE PARTS

C-64 Power Supply	34.95
128 Power Supply	59.95
C-64 Over Voltage Sensor	19.95
Other Parts	CALL

(Plus $3.00 Shipping/Handling)

All parts for Commodore equipment usually in stock
For Parts Call (312) 879-2350
Dealer Discounts Available

TEKTONICS PLUS, INC.
150 HOUSTON STREET
BATAVIA, IL 60510
CLIP AND SAVE

MasterCard VISA

Prof Jones ®

PROFESSIONAL HANDICAPPING SYSTEMS™

"COMPUTER SOFTWARE FOR THE SERIOUS HANDICAPPER"

Mini-Pro Analysis	$149.95
Professional Analysis	$249.95
Analysis w/Multiple Regression	$399.90

Professional Lottery/Lotto	$149.95
Professional Football	$199.95
Bookie Buster	$149.95
Pro-Bookie Combination	$299.95
Basketball Addition	$149.95

WATCH FOR THESE NEW PRODUCTS COMING SOON!

Market-Maker™ Stock market analysis
Bookie Buster II™ Football predictor--60 analysis
Professional Speed Handicapper™ for horses

CALL NOW--TOLL FREE **1-800-553-2256**

TO RECIEVE YOUR **FREE CATALOG**

DEMO SOFTWARE *w/manual*
$15.00--$25.00 each

1940 West State Street, Boise, Idaho 83702 (208) 342-6939

V5.0 ULTRABYTE DISK NIBBLER

NIBBLE COPIER WITH 205 PARAMETERS FOR COMMODORE 64 AND 128

- Copies most protected disks in 2 minutes without need for parameters including rapid-locked
- 205 parameters to make unprotected copies of recent programs including VMAX protection. Send stamped envelope for list
- Copies up to 40 tracks using 1 or 2 1541 or 1571 drives. Copies both sides on 1571
- Copies itself (for this reason, no refunds given)

V5.0 $29.95 PLUS $4.00 SHIPPING

Also available:

1. Disk Surgeon V2.0 -- new disk utility $10.00
2. Ultramail -- mail list and labels ..... } both for
   Handy-Capper -- race handicapper ..... } $10.00
3. McMurphy's Mansion -- text adventure .... } both for
   Soluware -- solutions to 10 adventures .... } $10.00
4. 150 older parameters and file copier $10.00

Add $4.00 shipping (covers up to 5 items)

Mastercard, Visa, Check or M.O., Calif. add 6.5% ($1.85) sales tax. Foreign orders/COD add $2.00. Payment must be in U.S. funds

UPDATES - Return original Ultrabyte disk with $15.00 plus $4.00 shipping. Foreign add $2.00. No exceptions.

To order, write or call 24 hr. order line. For info. write.

ULTRABYTE (818) 796-0576
P.O. Box 789 LaCanada, CA 91011 USA

COMMODORE <= => IBM MS-DOS

File Transfer Utility

BIG BLUE READER 128/64

If you have the Commodore 128 or 64, and the 1571/1581 disk drive, you can read from and write to IBM PC compatible MS-DOS files using **BIG BLUE READER 128/64.** The program quickly and easily transfers Commodore and IBM word processing, text and ASCII files.

- BBR 128 transfers files between Commodore 128/64, MS-DOS and C128 CP/M diskettes on both Commodore 1571 and 1581 disk drives.
- BBR 64 **requires the Commodore 1571** and transfers files between Commodore 64/128 and IBM MS-DOS diskettes.
- Optional Commodore ASCII to standard ASCII translation.
- Both programs are easy to use and fully menu driven.
- Can be used as a standard Commodore 128/64 file copy program, transfer files between: 1541/1571/1581 disks.

The Big Blue Reader 128/64 package is only $44.95

Order with check, money order or C.O.D. All orders must be in U.S. dollars.
Free shipping on all U.S. & Canadian orders. COD & foreign orders add $3.00
BBR 128/64 available to current BBR users for $18 plus your original disk.
To order Call (219) 724-3900 Write for more information. In UK Tel: (0905) 611463

SOGWAP Software
115 Bellmont Road; Decatur IN 46733; (219) 724-3900

Classified

SOFTWARE

FREE SOFTWARE for C-64, C-128, IBM & CPM send SASE for info (specify computer) to: PUBLIC DOMAIN USERS GROUP PO Box 1442-A2, Orange Park, FL 32067

FREE PUBLIC DOMAIN SOFTWARE - Request free catalog or send $2 for sample disk and catalog (refundable). C64-128 CALOKE IND., Dept. JK, Box 18477, K.C., MO 64133

More than 200 great ML routines for 64 and 128, ready to add to your own programs, in COMPUTE! Books' MACHINE LANGUAGE ROUTINES FOR THE COMMODORE 64/128. Explanations, uses, commented source code. 585 pages, $18.95. Check your local bookstore or call (800) 346-6767.

THOUSANDS OF PD PROGRAMS FOR C64/128! We have Games, Utilities, Music and much more! For information write: Lightspeed Software, POB 7037, Chesapeake, VA 23323

RENT 64/128 SOFTWARE! 100's of disks. Lowest prices. No deposit or fee. Free catalog. Centsible Software, PO Box 930, St. Joseph, MI 49085 (616) 982-0327

COMMODORE: TRY BEFORE YOU BUY. Best selling games, utilities, educational + classics and new releases. 100's of titles. Visa/MC. Free brochure. RENT-A-DISC, Frederick Bldg. #345, Hunt'n, WV 25701 (304) 529-3232

C64/128 FINEST PUBLIC DOMAIN PROGRAMS Pretested quality programs * Most $1.50 * * On Disk * YOU pick the programs that YOU want!!! Free diskfull of programs with first order! For a list + Description send SASE to: JLH Co, Dept. G, Box 67021, Topeka, KS 66667

C64/128 EDUCATIONAL P.D. SOFTWARE By grade level and subject, ie K-3 math, K-3 English, 4-6 math, etc. Catalog $2 PSL Inc., Box 750 A, Old Bridge, NJ 08857

PUBLIC DOMAIN SOFTWARE FOR C64/128 100 programs only $10 or 260 programs for $25 or $2 for catalog (refundable) MERIT, Box 114 A, Spotswood, NJ 08884

FREE SOFTWARE for C64. Send 1 stamp for Catalog. Games-Educ-Home-Business-Music Utilities. RVH Publications, 4291 Holland Road, #562-G, Virginia Beach, VA 23452

WordStar™* V2.26 For C-128 $39.95+$4.50 p/h. Public Domain Software Copying Co. 33 Gold St., Ste. L3, New York, NY 10038 *™MicroPro® **800-221-7372**

HAVE YOU EVER WANTED TO CLIMB EVEREST? Lead a team of 12 climbers to the summit in "Everest Assault", a strategic simulation of a Himalayan expedition. C64 or 128 disk $9.95. High Country Software, 881 E. Thames, Highlands Ranch, CO 80126

SIMONS BASIC, MAGIC DESK, OR GENEOLOGY $10 ea. Pilot, Constitution I.Q. game or Typing Professor $8 ea. Big list $1. Free shipping. Checks only to: Basic Fun Co., 3366 S. 2300 E., S.L.C., UT 84109

M BASIC™* or FORTRAN 80™* $39.95+$4.50 p/h. Public Domain Software Copying Co. 33 Gold St., Ste. L3, New York, NY 10038 *™MicroSoft® **800-221-7372**

SUN DEVIL DISK RENTAL FREE MEMBERSHIP Over 200 titles VISA/MC accepted. Send for free catalog. 2015 East 5th, Ste. #5, Tempe, AZ 85281 (602) 827-9749

IF YOU OWN A C64 YOU SHOULD HAVE THE NEW Programmer's Helper Disk. Indispensable for the practical C64 user. Free Details. CHEMTRON LABS, Box 152, Ronkonkoma, NY 11779

HARDWARE

C-64 REPAIR $39.95 including parts/labor or LOW COST COMMODORE CHIPS: 6510/6526-$9.95. PLA/82S100-$12.95, AMIGA CHIPS and many others. HD power supply/C64-$27.95. Kasara Inc., 33 Murray Hill Dr., Spring Valley, NY 10977, 1-800-248-2983, 914-356-3131.

12 volt C64 Power Supply $42.95 ppd! Take it anywhere! Also 1541 12 volt mod's! DEVCOM, 336 Joya Loop, White Rock, NM 87544 (505) 672-9742

THE AMAZING NEW
VOICE MASTER® Junior

...TURNS YOUR COMPUTER INTO A TALKING AND LISTENING SERVANT... $39.95

Get speech output and voice recognition in ONE product. Voice Master Jr. is easy to use with new commands added to BASIC. A music bonus lets you write and compose by whistling the tune! Unlimited uses for fun, education, practical applications. Demo programs included. Price only $39.95 including software and manual. A Patented price/performance breakthrough!

TO ORDER BY MAIL include $4 shipping & handling ($6 Canada, $12 overseas) per order. Visa, MasterCard phone orders accepted. Available for C64/128 and Atari 800/800XL/130XE. Specify when ordering. 30 day money back guarantee, one year warranty. Other enhanced voice I/O systems are available for Commodore, Apple, and IBM computers.

Call or write today for FREE Product Catalog
COVOX INC. (503) 342-1271
675 Conger St., Eugene, Oregon 97402

MISCELLANEOUS

Now Commodore Qualified Repairs! C64:$45, 1541:$50, SX64:$65, C128:$50, 1571:$55. Buy Sell Trade New/Used - Fast Service! 30 day wnty! Mom & Pop's Computer Shop, RR2, Box 119, Cainsville, MO 64632 (816) 872-6311

C-NET BULLETIN BOARD FOR THE 64 & 128. The most widely used and respected BBS available. 300/1200/2400 BPS, 1000 accounts, 40 message/file transfer SIGS, X-modem, Punter, a FAST ML EDITOR, on-line games, AND MUCH MORE!
SOFTECH
COMPUTER SYSTEMS, INC.
POST OFFICE BOX 23397
LEXINGTON, KY 40523
(606)/268-BAUD (TECH SUPPORT)
(800)/992-SCSI (ORDERS ONLY)
Call for our everyday low price on hardware!
VISA/MasterCard/COD WELCOME

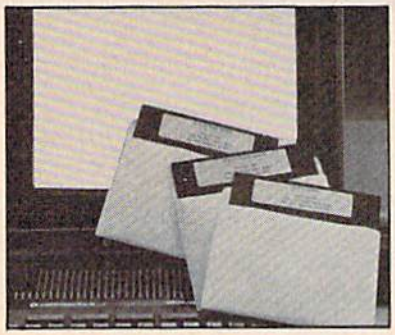
Authorized Comm Repair! All Models! C64:$41, +/4:$37.95. Parts available TOLTECH, 11368 Highway 145, Cortez, CO 81321. (303) 565-7633 VISA, MC, COD or MO.

COMPUTE!'s Gazette Classified is a low-cost way to tell over 225,000 microcomputer owners about your product or service.

Rates: $25 per line, minimum of four lines. Any or all of the first line set in capital letters at no charge. Add $15 per line for boldface words, or $50 for the entire ad set in boldface (any number of lines.) Inquire about display rates.
Terms: Prepayment is required. Check, money order, American Express, Visa, or MasterCard is accepted. Make checks payable to COMPUTE! Publications.
Form: Ads are subject to publisher's approval and must be either typed or legibly printed. One line equals 40 letters and spaces between words. Please underline words to be set in boldface.
General Information: Advertisers using post office box numbers in their ads must supply permanent address and telephone numbers. Orders will not be acknowledged. Ad will appear in next available issue after receipt.
Closing: 3rd of the third month preceding cover date (e.g., June issue closes March 3rd). Send order and remittance to: Kathleen Ingram, Classified Manager, COMPUTE!'s Gazette, P.O. Box 5406, Greensboro, NC 27403. To place an ad by phone, call Kathleen Ingram at (919) 275-9809.
Notice: COMPUTE! Publications cannot be responsible for offers or claims of advertisers, but will attempt to screen out misleading or questionable copy.

Use the handy *Reader Service Card* in the back of the magazine to receive additional information on our advertisers.

SAVE OVER 35%



PLUS 4™ SOFTWARE

Turn your home computer into a household finance organizer, learning center, and entertainment center. The Plus 4™ Software Package contains three floppy diskettes compatable with the Commodore® Plus 4™ computer. Due to special arrarngements with the manufacturer, you save.

Software Package Contains: *Fun and Games* disk with more than 20 imaginative games for the whole family to enjoy, plus music and graphics selections. The second disk is *Utilities/Finance*. It can help you organize and maintain files, lists and information. The Finance section is designed to help you organize your personal and home finances and investments. The third disk is *Education*. A fun way for students to learn more about math, language, geography, science, history and more.

Compute the Savings! You don't need a computer to figure out this is an exceptional value...one that everyone in the family will enjoy.

Mfr. List Price **$30.00**

Liquidation Price/Set **$19**

Item H-3634-7235-294
S/H: $4.00/set

Credit card customers can order by phone, 24 hours a day, 7 days a week.
Toll-Free: 1-800-328-0609

SEND TO:
COMB Authorized Liquidator
1405 Xenium Lane N/Minneapolis, MN 55441-4494

Send ___ Plus/4™ Software Set(s) Item H-3634-7235-294 at $19 per set, plus $4 per set for insured shipping, handling. (Minnesota residents add 6% sales tax. Sorry, no C.O.D. orders.)

☐ My check or money order is enclosed. (No delays in processing orders paid by check.)

PLEASE CHECK: ☐ VISA ☐ ☐ ☐

Acct. No. _____ Exp ___/___

PLEASE PRINT CLEARLY

Name _____

Address _____ Apt. # _____

City _____ State _____

ZIP _____ Phone (___) _____

Sign Here _____

GET MORE PLEASURE FROM THE BIBLE WITH

LANDMARK
The Computer Reference Bible

Here's what LANDMARK will enable you to do:

- ✔ SEARCH THROUGH THE BIBLE---Find Phrases, words or sentences.
- ✔ DEVELOP TOPICAL FILES---Copy from The Bible text and search results then add your own comments and notes.
- ✔ COMPILE YOUR PERSONAL BIBLE--- Outline texts in color. Add Notes and comments. Create your own supplementary Study files.
- ✔ CREATE FILES--- Then convert them for use with wordprocessors like Paperclip and GEOS.
- ✔ MAKE SUPPLEMENTARY STUDY FILES--- and develop translation variations.

LANDMARK TCRB is only **$164.95**

CALL OR WRITE TODAY FOR A FREE BROCHURE, WHICH SHOWS HOW VALUABLE LANDMARK CAN BE IN YOUR BIBLE STUDY

P.A.V.Y. Software P.O. Box 1584
Ballwin, MO 63022 (314) 527-4505
ALSO AVAILABLE AT YOUR LOCAL COMPUTER DEALER!

ADVERTISERS INDEX

Reader Service Number/Advertiser	Page
102 Abacus	17
103 Abacus	53
104 Aprotek	55
Berkeley Softworks	11
105 Capcom	31
106 C.O.M.B. Authorized Liquidator	100
107 CompuServe	5
108 ComputAbility	93
109 Computer Direct	56–57
110 Computer Repeats, Inc.	97
111 Computer World	95
Crown Custom Covers	100
112 Datel Computers	23
113 Datel Computers	24–25
114 Electronic Arts	IFC
115 Electronic Arts	1
116 Epyx	IBC
117 Fearn & Music	45
118 Free Spirit Software, Inc.	87
119 Greensboro Computer Center	96
120 Lyco Computer	48–51
121 M.C.S.	82–83
122 MIBRO Co., Inc.	91
123 Micro Prose	7
124 MicroWorld Electronix	96
125 Montgomery Grant	85
126 Oceanic America	29
127 P.A.V.Y. Software	100
128 Precision Data Products	100
129 Professional Handicapping Systems	98
130 Q-Link	15
Renco Computer Supplies	96
131 S & S Wholesalers	89
Schnedler Systems	97
132 Software Discounters of America	80–81
133 Software Simulations	BC
Software Support International	28
Software Support International	46–47
Sogwap Software	98
134 Strategic Simulations	9
135 subLOGIC Corporation	2
136 subLOGIC Corporation	19
Tektonics Plus, Inc.	98
137 Tenex Computer Express	79
138 TEVEX	95
139 Tussy Computer Products	20–21
140 Ultrabyte	98
141 Utilities Unlimited, Inc.	36
142 Xetec	16

Classified Ads	99
COMPUTE! Books' Music System for the Commodore 128 & 64	68

WHOLLY KAO.

Diskette data loss has many causes. That's why Kao manufactures and tests every part of every diskette we sell.

3.5" DISKETTES

SS Boxed	$ .99 ea.
DS Boxed	$1.39 ea.
HD Boxed	$3.21 ea.
DS Bulk	$ .99 ea.

WE'VE GOT YOUR RIBBONS!

Apple Dot Matrix, Imagewriter #T437	$3.75
Apple Daisywheel #T479	$3.15
Diablo HY Type II #T471 (M/S)	$2.65
#T473 (Nylon)	$3.25
Epson LQ800 #T517	$4.15
Epson LQ1000 #T519	$5.15
Epson LQ1500 #T466	$4.15
IBM Proprinter Model 4201 #T445	$3.95
Okidata 120, Microline 182, 192, 193 #T414	$4.95
Panasonic KXP-1090 #T429	$5.95

Prices are per ribbon, minimum 12 ribbons
©1988 GENERAL RIBBON CORP.

— ORDER NOW —

You get more for your money when you choose our high quality, trouble free, guaranteed ribbon!!

MINIMUM ORDER: $25.00. S&H: Continental USA; $4.00 first 100 or fewer disks; $3.00, each succeeding 100 or fewer. $2.00 Doz/Ribbons. Foreign Orders, APO/FPO require add'l shipping charge. MI Residents add 4% tax. COD, add $4.00; payment with cash, certified check or money order. Prices subject to change.

Precision Data Products™
P.O. Box 8367, Grand Rapids, MI 49518
(616) 452-3457 • FAX (616) 452-4914
Michigan 1-800-632-2468
Outside Michigan 1-800-258-0028
COD

DUST COVERS

SATISFACTION GUARANTEED

★ CUSTOM MADE TO FIT
★ HEAVY 32-oz. VINYL ANTI-STATIC
★ EXTENDS EQUIPMENT LIFE
★ Choice of Colors Light Tan or Brown

COMPUTERS	
C-64/Plus 4/C-64C	8.00
C-128	13.00
Datassette (C2N)	5.00
Amiga 1000	13.00
(W/Amiga Mon. Stacked)	28.00
Keyboard only	7.00
Atari 800XL, 130XE	10.00
Atari 520 ST	14.00
IBM PC/XT	28.00
IBM 5051 Keyboard	8.00
(Dimensions Required for IBM Clones)	
DISK DRIVES	
C-1541, C-1571	8.00
Amiga 3½" D/Drv	8.00
Amiga 5¼" D/Drv	9.00
Indust GT, MSD SD-1	8.00
MSD SD-2	10.00
Enhancer 2000	8.00
FSD-1	8.00
Atari 1050	8.00
PRINTERS	
C-1525/MPS 801	10.00
C-1526/MPS 802	13.00
C-MPS/803, C-1520	8.00
Panasonic 1090/91	13.00
Okidata 120/192	13.00
Okimate 10/20	8.00
Epson MX/FX/RX80	13.00
Epson LX80/C-1000	13.00

PRINTERS	
Seikosha SP-1000	13.00
Comrex 220	13.00
C'Itoh 8510	13.00
Juki 5510	13.00
Imagewriter	13.00
Epson JX 80	13.00
Epson FX 85/185	13.00
Okidata 92	13.00
Citizen MSP 10	13.00
C/DPS 1101	16.00
Gemini 10 & Star 10's	13.00
Gemini 15 & Star 15's	16.00
Atari 1027	13.00
MONITORS	
Atari SC 1224RGB	19.00
C-1702, BMC Color	16.00
C-1902/Amiga	19.00
Amdek 500-700	19.00
CM-141 (C-1802)	19.00
C-1902A/Magnvx 40	19.00
NEC (State Model)	19.00
Magnavox 80 RGB	19.00
Princeton (State Model	19.00
Thompson CM 365-66	19.00
Taxan (State Model)	19.00
Sakata SC-100	19.00
Zenith (State Model)	19.00
VIDEO RECORDERS	13.00
State Make & Model Dimensions required including clock cut-out	

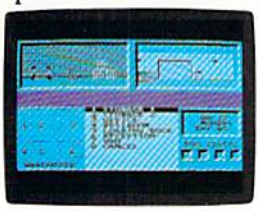
Order by stating MAKE, MODEL and COLOR CHOICE - TAN or BROWN with check or money order plus $1.50 per item ($4.50 max.) shipping and handling Calif. Res. include 6½% + local tax. APO, 2.00/item, Foreign 3.00/item

SPECIAL COVERS WILL BE MADE TO YOUR DIMENSIONS. SEND YOUR REQUIREMENTS FOR OUR LOW PRICE QUOTES.

Crown Custom Covers
24621 PAIGE CIRCLE DEPT. A
LAGUNA HILLS, CA 92653
(714) 472-6362

TAKE THE LAW INTO YOUR OWN HANDS.

What can you do about the drug problem in America? Play *L.A. Crackdown.* That's what. You're the veteran detective. Your assignment is to uncover a major ring bent on distributing an evil synthetic drug.



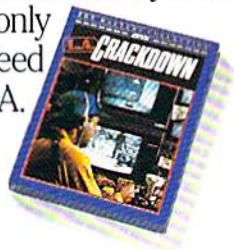
You can bug the thugs and watch the warehouse, both at the same time.

You've got the highest of high-tech surveillance vans to work from. You've also got a rookie to work with. We're talking "rookie" rookie. Zero experience.

You'll need to architect his every move. Watch him photograph clues. Plant bugs. Tail suspects. And question everyone from seedy thugs and crooked chemists to slick international heavies.

You'll also need to draw on every strategy brain cell available. If you're not thinking every minute, you might just spend all evening waiting on a street corner for a suspect who's never coming.

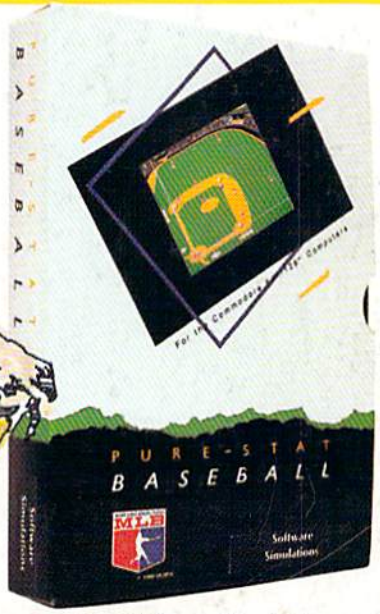
L.A. Crackdown. If you think your nervous system can handle the surprise action and tricky mental clues, there's only one thing you need to do. Move to L.A.



L.A. CRACKDOWN BY EPYX®

Commodore 64/128, IBM & compatibles, Apple II & compatibles

PURE-STAT BASEBALL™



From **Software Simulations** comes an incredibly sophisticated, realistic, and complete statistical baseball simulation for zero, one or two players. Game play, manager's functions, graphics, and a complete statistical library establish Pure-Stat Baseball™ as the ultimate sports simulation program.

Suggested retail price

$39.95

Optional Team and Create Your Own Team Disks Available.

Available for C-64/128, Apple, IBM-PC

Game Play

Pure-Stat Baseball's underlying statistical framework simulates the realities of baseball like never before. Within this framework the program considers each player's batting statistics against both **LEFT**- and **RIGHT**-handed pitchers, where available, and pitchers stats vs. both **LEFT**- and **RIGHT**-handed batters. Every player's fielding and base-running abilities are also considered (an important factor when attempting to steal a base, etc.)

Select the team you'd like to manage, then pick the team you want to play against. Every team from the 1985 season is accurately represented, along with eight classic teams from the past. Determine your starting lineup, designate a starting pitcher, and make player substitutions when necessary. You call the plays, offense and defense. In a one-player game, your computer opponent displays un-canny intelligence in reacting to your managing decisions.

Manager's Functions

Built-in manager's functions provide extra versatility. The Trading function gives you the opportunity to create the "what if" team(s) you've always dreamed about. With this function you can have Dwight Gooden playing with Mickey Mantel and Babe Ruth. Or, if you like, you can form your own draft leagues from existing teams and play against your friends for your own pennant and World Series.

The Stat-Keeper function compiles all of the players' statistics for you and calculates Batting Averages and pitchers' ERAs. You can track your own teams' performances and print the season statistics for your club or league.

Stadium Disk

An optional Stadium Disk is also available that lets you play in any of the twenty-six Major League stadiums.

Statistics

Pure-Stat Baseball™ can maintain a complete statistical record of each team player's performance. You can print all of your players' year-to-date performance statistics at anytime throughout the season. All player stats and game Box Scores can be displayed on the screen or sent to an external printer for a hardcopy printout. The PRINT TEAM STATS function can be used at the end of the season to determine your Most Valuable Player, or to review your club's performance.

Pure-Stat Baseball™ also includes a unique Auto-Play option that lets the computer play a complete game in less than three minutes. A whole series of games can be played unattended, and an entire season of player and team statistics can be compiled over several days with all game stats printed out for your records.

Discover for yourself just how enjoyable a baseball simulation game can be. Pure-Stat Baseball,™ the first real baseball game on a computer.

VISIT US IN CHICAGO AT THE CES, JUNE 4-7, 1988.

Software Simulations

959 Main Street, Stratford, CT 06497
203/377-4339